Data Projector

PROJECTOR

Service Manual

EMP-1825/
EMP-1815/
EMP-1810

EPSON

INTRODUCTION

This Service Manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the EMP-1825/1815/1810. This information is intended for the experienced repair technicians, and attention should be given to the precautions on the preceding pages.

This manual consists of four chapters and Appendix.

Chapter 1	**PRODUCT DESCRIPTIONS** Provides a general overview and basic specifications, specifications of controls, interfaces, consumable supplies, and after service parts.
Chapter 2	**OPERATING PRINCIPLES** Describes the configuration of each mechanism, theory of operations of the basic mechanisms and controls in this product.
Chapter 3	**TROUBLE SHOOTING** Describes the step-by-step procedures of the trouble shooting.
Chapter 4	**DISASSENBLY & ASSEMBLY** Describes the step-by-step procedures for disassembling and assembling the components.
Chapter 5	**ADJUSTMENT** Describes the step-by-step procedures for adjusting the functions after replacing the specific parts.
Chapter 6	**APPENDIX** Provides maintenance information (After service menu etc.) required for servicing the product.

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REVISION HISTORY

After first release of this manual, the parts and mechanism may be subject to change for improvement of their performance and the manual may be revised. Be sure to always keep this manual up to date.

History	Date	Detail of change
Rev.A	2006.12.27	First Release
Rev.B	2007.4.13	P4-17 Change in SW cable forming
Rev.C	2007.11.30	All pages Additional information added for EMP-1825.

IMPORTANT PRECAUTIONS IN SAFETY AND MAINTENANCE PERFORMANCE

Here describes the important points to keep in mind in repair and maintenance performance.

Symbols

To prevent injury to the repair technicians and to protect the devices, the categorized safety instructions are provided in this manual with the symbols below. Be sure to read and understand their meanings before proceeding to the next section.

Category	Symbol	Meaning
Danger		Indicates an extremely hazardous operation which, if ignored or operated incorrectly, could result in serious or fatal personal injury.
Warning		Indicates a potentially hazardous operation which, if ignored or operated incorrectly, could result in serious or fatal personal injury.
Caution		Indicates a potentially hazardous operation which, if ignored or operated incorrectly, could result in minor injury or damage to equipment.
Prohibited Matter		Indicates a prohibited action or operation in repair and maintenance performance.
Instruction		Indicates a compulsory action or operation that must be carried out in repair and maintenance performance.

Safety Instructions

The precautionary measures itemized below should be fully understood when performing repair and maintenance procedures.

WARNING	
	When disassembling/assembling, be sure to turn off the power switch and pull out the power cable from the projector beforehand.
	Never touch the current-carrying part or high temperature section during a test operation, signal measurement or any other situations that is necessary to perform the repair/maintenance work with the power turned on and the cover removed. Do not wear the metal products such as wrist watch, cuff buttons, rings, tiepin etc. to avoid getting a electric shock.
	Do not touch the lamp assy. or the parts around it. They are extremely hot even after completed the cooling down operation, and may cause a burn injury. Therefore, leave the unit until it becomes cool enough before performing maintenance work.
	Never let the safety devices mounted in this product inactivated for any reason whatsoever.
	Never modify the safety devices or replace them with the ones that are not designated for any reason whatsoever. (Such actions may cause a fire or serious injury.)
	Never modify the product for any reason whatsoever. (Except for a case that is under the instructions to do so.)
	Never peer through the projection lens during repair/maintenance work when the power is on. (Such an action may cause a visual disability because of a very strong light emission.)
	Never use a deformed plug or a damaged power cable to this product. If any deformations or damages are found on the power cable or plug section, replace it with a new specified power cable.
	Never use the air blowers that contain flammable gas in repair/maintenance work.

CAUTION	
	Never use or replace with any service parts that is not specified by EPSON.
	Be sure to perform the repair/maintenance work on the even and stable work bench to prevent the product from dropping down or mal-operation due to the improper setting of the product.
	Be sure to wear the gloves during the repair/maintenance work to avoid injuries by the parts with sharp edges such as metal plate or the like.
	To protect sensitive circuitry, follow the instructions below. • When disassembling or reassembling, be sure to wear static discharge equipment such as an anti-static wrist strap and a mat. • When replacing the circuit component such as a board or the optical engine, be sure to contact the anti-static case containing the new one to the metal part of this product before taking it out.
	When performing the repair/maintenance work, be sure to use the specified tools and follow the instructions that are specified in the documents (service manual etc.) concerning to this product.
	When carrying out the test operation, do not block the intake and exhaust ducts. (Such an action raises the internal temperature and may cause a fire or a damages to the internal parts of this product.)
	Be careful not to drop a metal part such as a screw, a washer, or a clip into the inside of the product. If such cases should occur accidentally, never turn on the power supply until all the dropped parts are found and removed.
	After reassembling the product, check the followings before turning the power on. • All the parts and screws are installed and secured to the proper positions. • No cables are caught in the metal frames.

Other Caution

■ Since the lamp of this product contains mercury, be sure to dispose the used lamp pursuant to the government's law and regulations.

Chapter 1 Product Specifications

1.1 Product Features 1-2
1.1.1 Features of the Projector 1-2
1.2 Specifications 1-3
1.3 External Views 1-4
1.4 Dimensions for Ceiling Mount 1-6

Chapter 2 Theory of Operation

2.1 Internal Components 2-2
2.2 Hardware Overview 2-3
2.2.1 Electrical Circuit Components 2-4
2.2.2 Optical Engine 2-6
2.3 Temperature Control 2-7
2.3.1 Sensors and Switches 2-7

Chapter 3 Troubleshooting

3.1 Before Carrying Out Troubleshooting 3-2
3.1.1 Troubleshooting Tools and Equipment 3-2
3.2 Basic Information on Troubleshooting 3-3
3.2.1 LED Indicators 3-3
3.2.2 Cable Connection and Projector's Status 3-6
3.3 Troubleshooting 3-9
3.3.1 Basic Checking Flowchart 3-9
3.3.2 Abnormality Check 3-10
3.3.3 Exterior Check 3-11
3.3.4 Connection Check 3-12
3.3.5 Power ON/OFF & Initialization Check 3-14
3.3.6 Image Display & Quality Check 3-15
3.3.7 Audio I/O's Check 3-17
3.3.8 Lens Shutter's Operation Check 3-18
3.3.9 Control Panel's Operation Check 3-19
3.3.10 RC & Projector's Operation Check 3-20
3.3.11 Wireless/Wired LAN's Operation Check (EMP-1825/1815 only). 3-21

Chapter 4 Disassembly/Assembly

4.1 Overview 4-2
4.1.1 Precautions 4-2
4.1.2 Precautions which must be taken when servicing 4-3
4.1.3 Safety precautions 4-3
4.1.4 Tools and Equipment 4-4
4.1.5 Precautions for Optical Engine and Main (MA) Board 4-5
4.2 Projector Disassembly and Assembly 4-6
4.3 Removing Exterior Parts/Components 4-10
4.3.1 Removing the AS Lamp Unit 4-10
4.3.2 Removing the Air Filter Assy. 4-11
4.3.3 Removing the Front Foot Unit/Rear Foot/Rubber Foot 4-12
4.3.4 Removing the IF-IM Case/Upper Case Unit AJ 4-13

4.4 Removing the Engine/Boards 4-20
4.4.1 Removing the Optical Engine and MAB (1) (MA Board Assy.) ... 4-20
4.4.2 Removing the Inner Exhaust Duct B/TH Board Assy. 4-40
4.4.3 Removing the Optical Engine and MAB (2) (Optical Engine) 4-42
4.5 Removing Other Main Parts 4-46
4.5.1 Removing the Inner Exhaust Duct A/Exhaust Fan Assy. 4-46
4.5.2 Removing the PS Fan/PS Ballast Assy./Speaker 4-48
4.5.3 Removing the PS Ballast Assy.(2) (Filter Board Unit)/Lamp Fan 4-51
4.5.4 Removing the Intake Fan/PBS Fan/AC Cable/RC Board Assy... 4-54
4.5.5 Removing the Ballast Filter Assy./Security Bar/Lower Case 4-58

Chapter 5 Adjustment

5.1 Overview 5-2
5.1.1 Required Adjustment List 5-2
5.1.2 Required Equipment/Tools 5-2
5.2 Adjustment (Calibration) 5-3
5.2.1 G-Sensor's Zero Point Adjustment 5-3
5.2.2 Inspection Procedure 5-3
5.2.3 CMOS Image Sensor Calibration 5-4
5.2.4 Inspection Procedure 5-8

Chapter 6 Appendix

6.1 AS (After Service) Menu 6-2
6.1.1 How To Display the AS (After Service) Menu 6-2
6.1.2 Initializing (Resetting) the AS Menu Values 6-5

Chapter 1 Product Specifications

1.1 Product Features

The EMP-1825/1815/1810 is a portable data projector in a compact body and with the following features.

1.1.1 Features of the Projector

☐ **EMP-1825/1815/1810 Common Features**

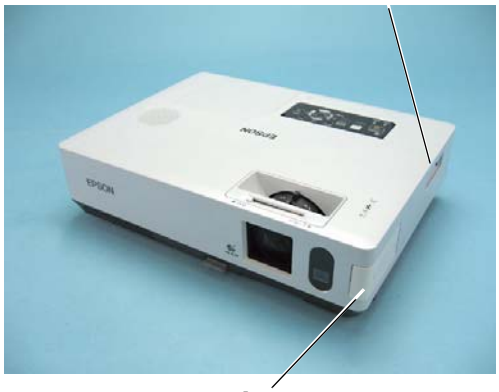
- ■ **Quick Setup**
  This feature corrects distortion in the projected image by a simple one-touch operation. Images can be corrected and matched to the size of the screen to simplify preparations.
- ■ **The A/V mute slide makes it easy to project and store**
  The A/V mute slide simplifies stopping and resuming projection. You can stop/resume projection simply by closing/opening the A/V mute slide.
- ■ **No need to cool down (Instant Off)**
  You can detach the projector's power cable soon after the power is off.
- ■ **Ample protect functions**
  •Password Protect
  By setting a password, you can control and restrict who can use the projector.
  •Operation Lock
  Setting this function effective can prevent someone from changing the projector's settings without permission in a situation such as the use in an event, or in a school.

☐ **EMP-1825/1815 Features**

- ■ **Wireless LAN fitted as standard equipment**
- ■ **Wired LAN terminal mounted**
- ■ **Enhanced Network function (EMP-1825)**
  Faster processing speed than EMP-1815 improves networking performance.
- ■ **USB display**
  Simply by connecting a USB cable to your computer, you can project images on your computer's display.
- ■ **Presentations without a computer**
  Simply by connecting the USB storage device containing the presentation data, you can make the presentation without a computer.
- ■ **Multi-screen display**
  You can project each virtual display set on the computer by using two or more projectors. You can use it to make file operations and arrangements for the virtual displays while projecting only the virtual displays.

EMP-1810

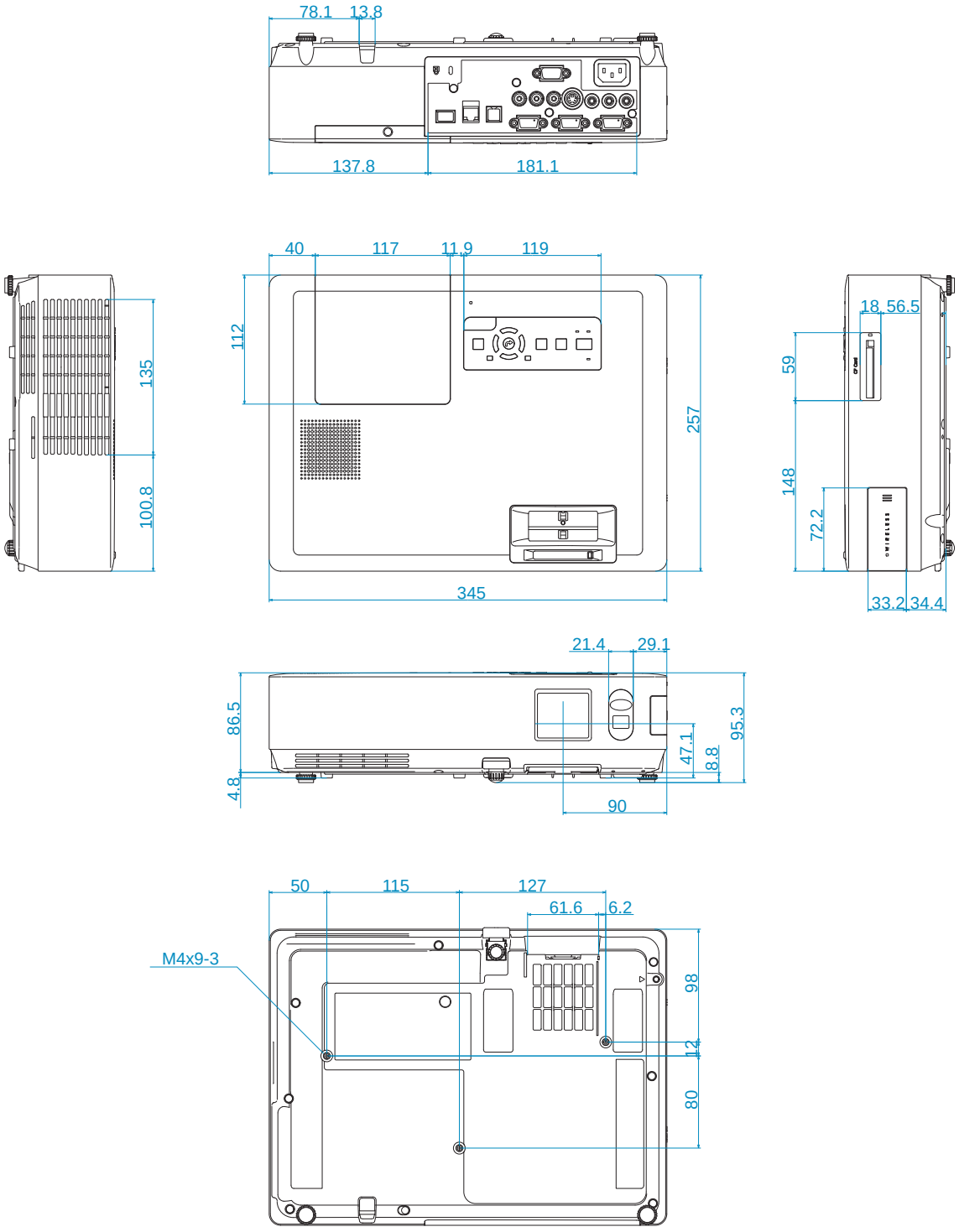
EMP-1825/1815



1.2 Specifications

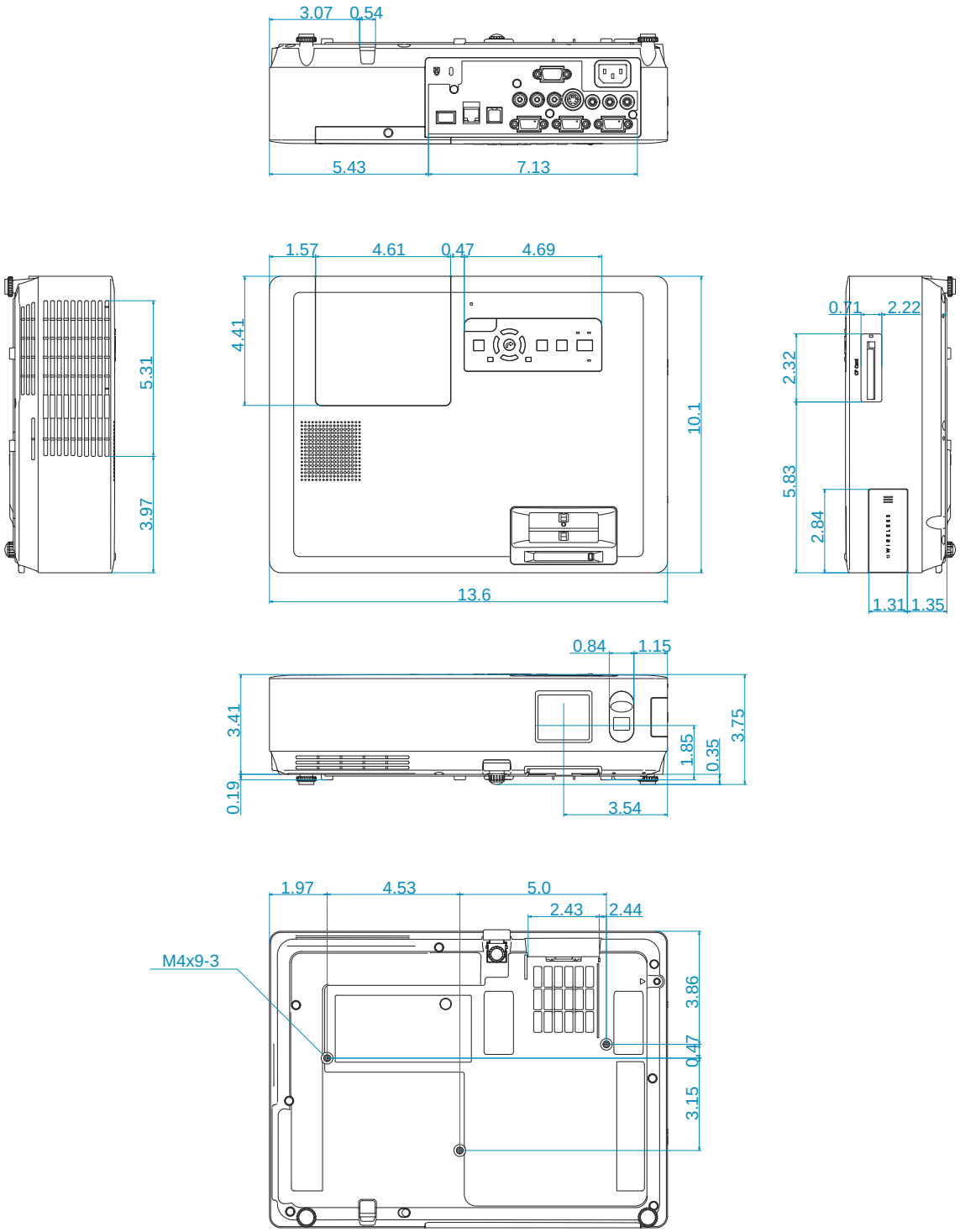
			EMP-1825/1815	EMP-1810
Specification of main parts	LCD	Size	0.8-inch with MLA	
			D5	
		Pixel number	786,432 dots (1024 x 768) x 3	
		Native Resolution	XGA	
		Aspect ratio	4:3	
	Projection Lens	Type	Manual zoom / Manual focus	
		Zoom ratio	1-1.6	
	Lamp	Type	210W UHE	
		Life	2500H(High Bright)/3000H(Low Bright)	
Brightness (Color mode: Game, Zoom: Wide)	High Brightness Mode		3500 ANSI lumens	
	Low Brightness Mode		2700 ANSI lumens	
Sound output			5W Monaural	
Card Slot			CF x 1 (3.3V)	N/A
Operating Temperature			5°C to 35°C <41°F to 95°F> (20% - 80% humidity) /Thermal shut down: T > 45°C 5×C to 35 ×C <41×F to 95×F> (over 1500 m / 4921 ft: with High altitude mode, High brightness) (20% - 80% humidity, unfrozen)	
Operating Altitude			0 m to 2286 m <0 ft to 7500 ft> (over 1500 m / 4921 ft: with High altitude mode)	
Start-up period			about 10 seconds (warm-up period: 30 seconds)	
Cool-down period			Instant off	
Power Supply Voltage			100 - 240 V AC +/10%, 50/60 H	
Power Consumption	100-120V Area (JAPAN, USA, etc.)	Lamp On	306 W	
		Standby (Network On)	12 W	
		Standby (Network Off)	2.6 W	
	220-240V Area (Europe, etc.)	Lamp On	286W	
		Standby (Network On)	12 W	
		Standby (Network Off)	4.6 W	
	Rated Voltage & Current		100 - 240 V AC 3.4 - 1.5 A 50/60 Hz	
Fan Stop			Standby & Network Standby	
Dimension	Exclude Feet (D x W x H)		257 x 345 x 86 mm	
	Maximum Dimension (D x W x H)		257 x 345 x 95 mm	
Weight			Approx. 6.9 lbs. / 3.1 kg	Approx. 6.5 lbs. / 2.9 kg
Fan Noise	High Brightness mode		37 dB	
	Low Brightness mode		32 dB	

1.3 External Views



Unit: mm

Figure 1-1. External Dimensions (mm)



Unit: inch

Figure 1-2. External Dimensions (inch)

1.4 Dimensions for Ceiling Mount

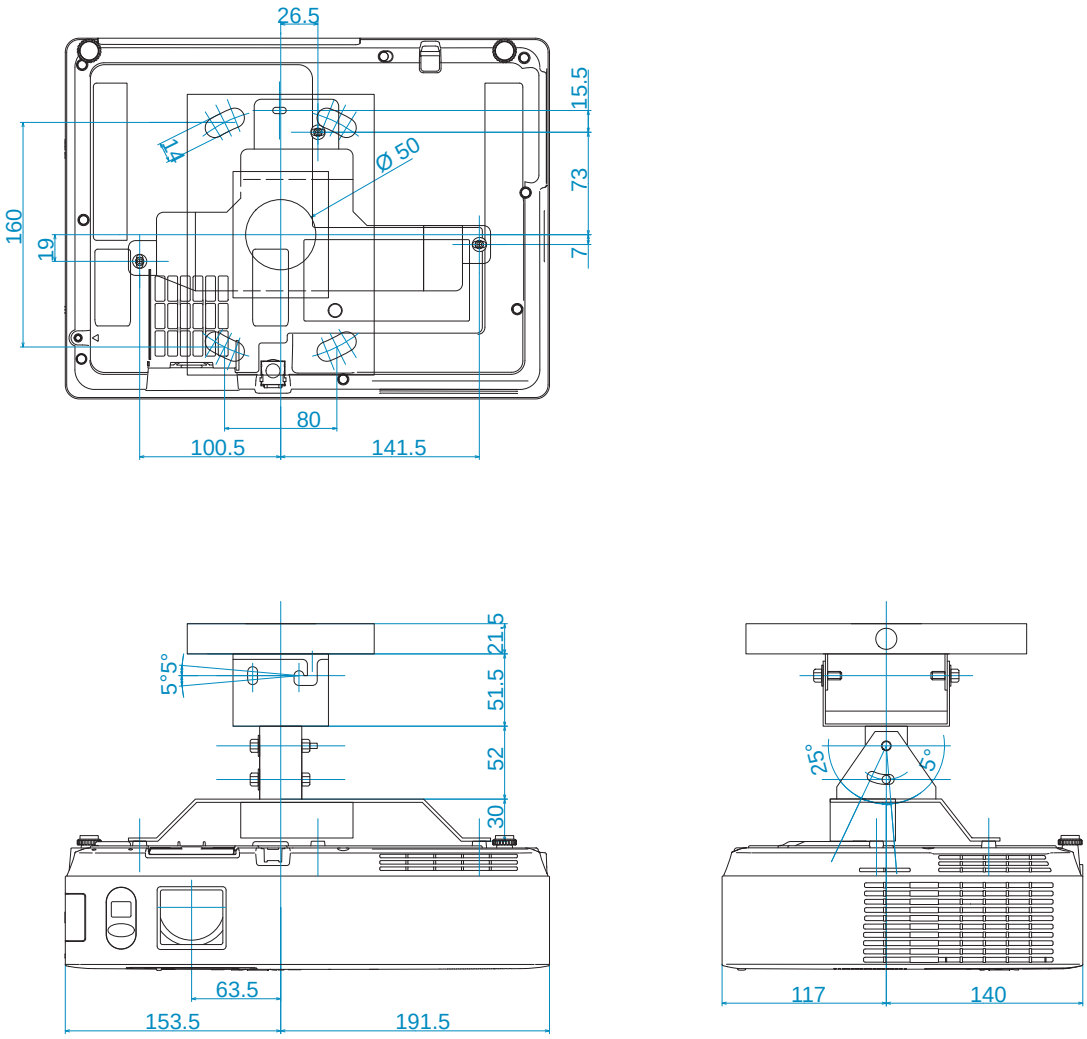


Figure 1-3. Dimensions for Ceiling Mount (cm)

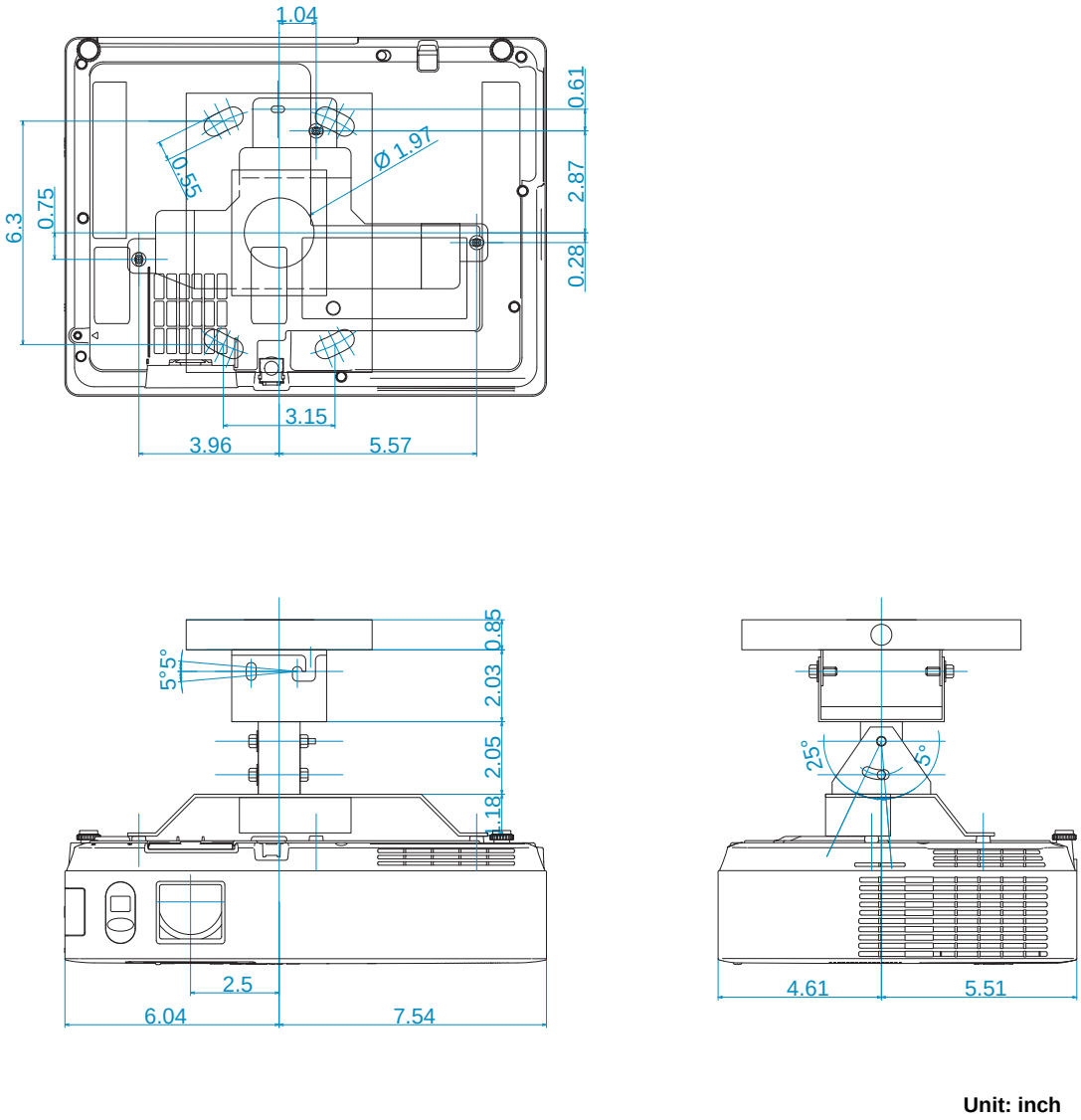


Figure 1-4. Dimensions for Ceiling Mount (inch)

Chapter 2 Theory of Operation

2.1 Internal Components

The main components that make up the projecter are shown in the figure below.

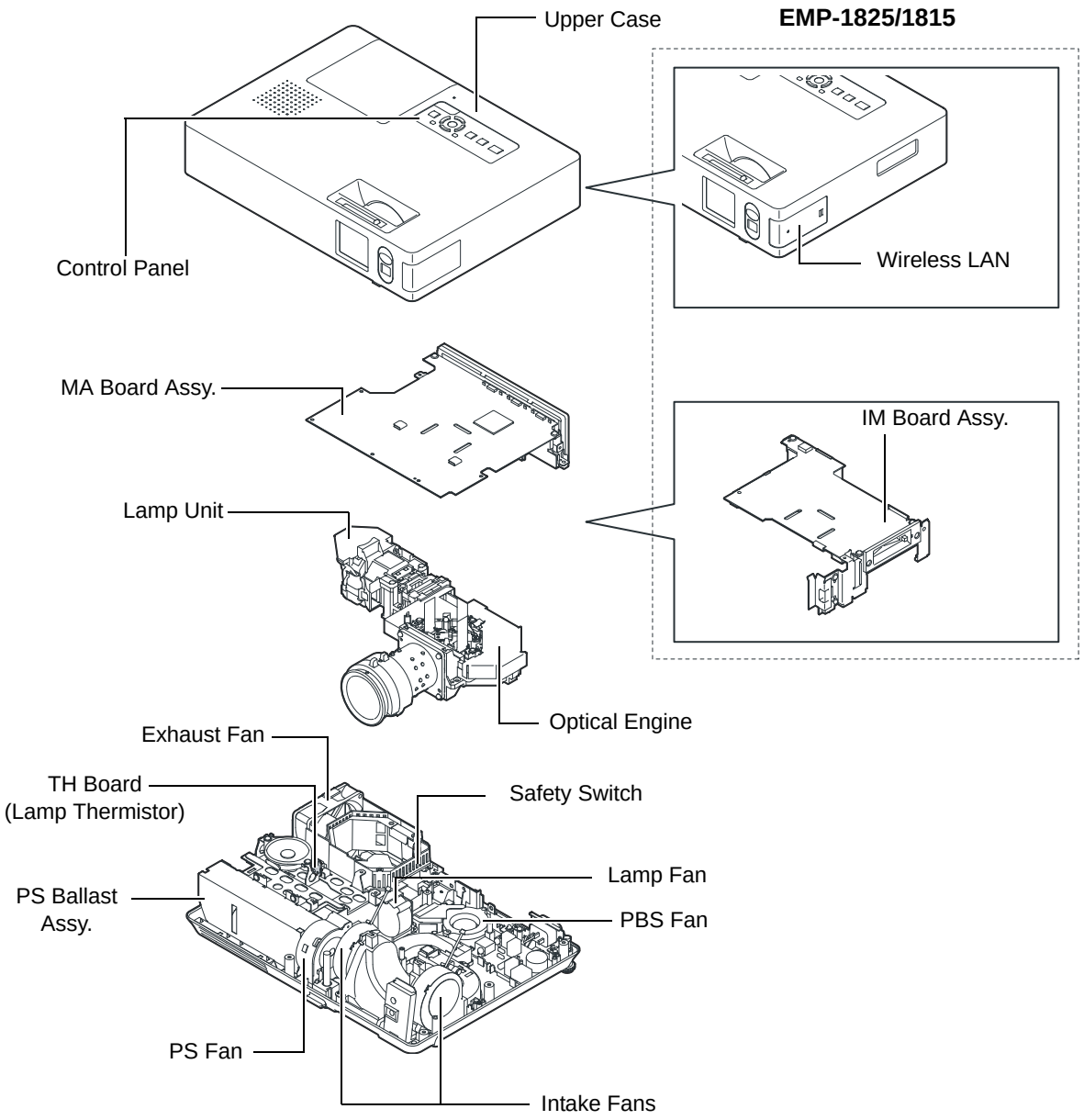


Figure 2-1.

2.2 Hardware Overview

The hardware of this projector consists of the optical block and the electrical circuit components. The overview of the hardware and functions is shown below.

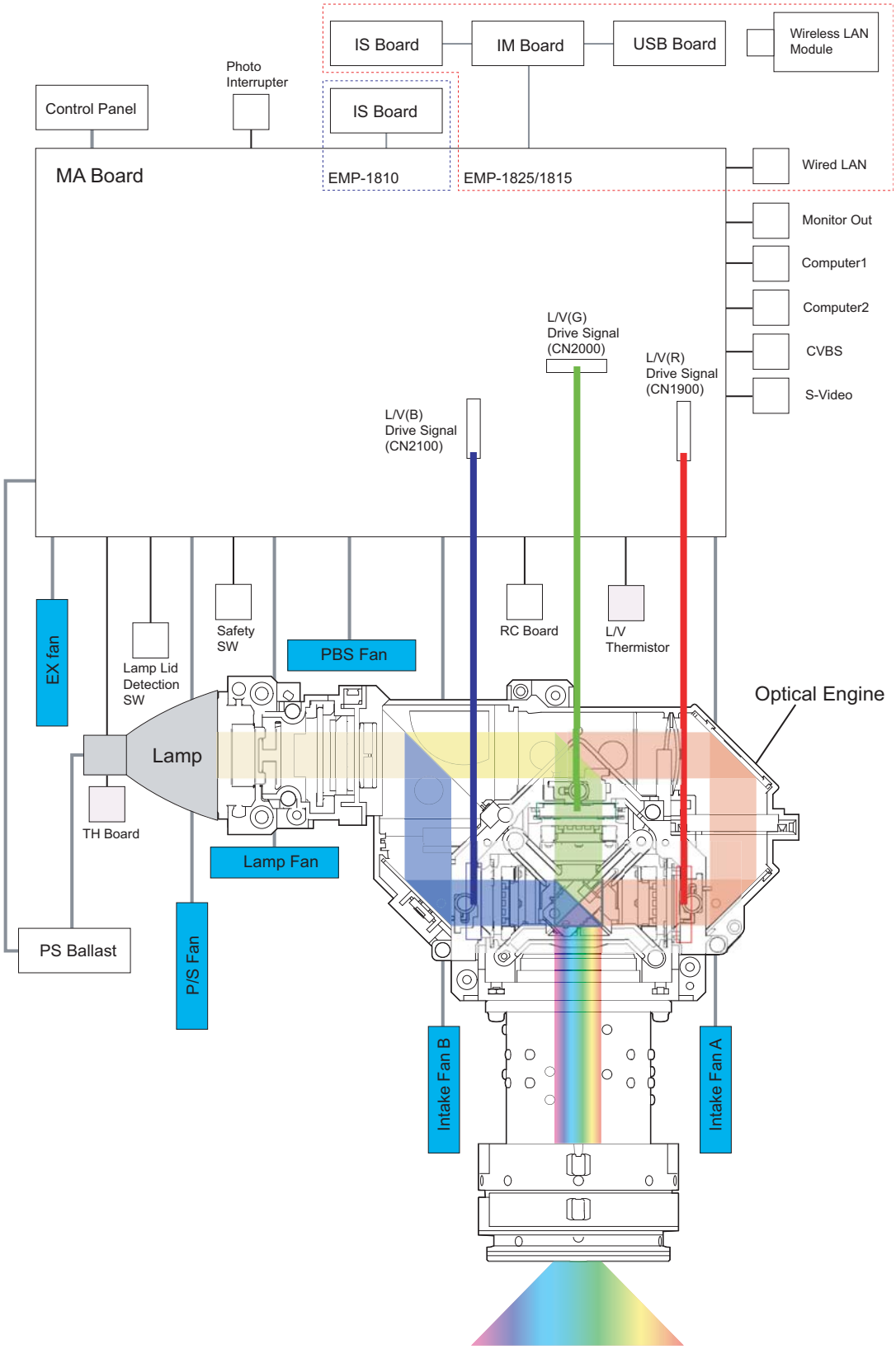


Figure 2-2.

2.2.1 Electrical Circuit Components

The components and their functions are explained below.

Component name		Function
MA Board		The circuit board that controls the whole system and functions of the projector. The main functions are listed below. • Degitally processes the input data from the external devices. • Generates the drive signals of the L/V (R/G/B). • Controls the external I/O interface. • Drives and controls the Lamp. • Monitors the sensors' input and controls the internal temperature with the fans (fan drive control).
PS Ballast Assy.	PS Unit	Generates and supplies the DC power used in each components from the AC input.
	Ballast Unit	Generates the power supply to drive the Lamp from the DC power supplied from the PS Unit.
Control Panel		The control part of the projector located on the Upper Case. Various buttons for each functions are mounted on the panel.
RC Board		Receives the IR signal from the remote controler. Mounted at the front and the back of the projector.
Fans	P/S Fan	Ventilates the PS Ballast Assy.
	Lamp Fan	Ventilates the Lamp.
	EX Fan	Exhausts the heated air generated inside the projector to the outside.
	PBS Fan	Ventilates the PBS of the Light Guide Unit.
	Intake Fan A/B	Take in fresh air and ventilate the L/V.
Sensors	TH Board (Lamp Thermistor)	The thermal detection sensor for the Lamp mounted on the Inner Exhaust Duct around the lamp. , The fans are controled based on the detected thermal data together with the one from L/V Thermistor explained below. The temperature around the Lamp exceeds the specified level, the "High Temp Warning" is issued. If the temperature continues to rise, the projecctor issues the "High Temp. Error" message with LED indicators and stop the Ballast Unit, and shuts off the power supply to the Lamp.
	L/V Thermistor	The thermal detection sensor for L/V mounted on the POP of the Optical Engine. The fans are controled based on the detected thermal data together with the one from Lamp Thermistor explained above. (The function of the thermistor and the warning signs are the same as the Lamp Thermistor above.
	Safety Switch	Functions as the safety device in the case of the loss of temperature control due to the failure of the thermistors. This is a detection switch for the prevension of overheating, and is mounted on the side of the Inner Exhaust Duct. If the internal temperature exceeds the specified level, the switch cuts off the AC power supply. The power supply cannot be activated until the internal temperature drops below the certain level.
	Lamp Lid Detection Switch	Detects the status of the cover for the lamp replacement. If the Lamp Lid opens, the power supply to the Lamp is cut off. In such a case, the power supply cannot be activated.
Lens Shutter Detection Sensor (Photo Interrupter)		The sensor using a photo interrupter to detect the status of the Lens Shutter. The "Closed" status is detected when the protrusion of the shutter for detection blocks the detection light inside the sensor. On the "Closed" Status: the solid black is displayed. the audio output switches to the A/V mute mode. the Lamp turns to the Low Brightness mode.

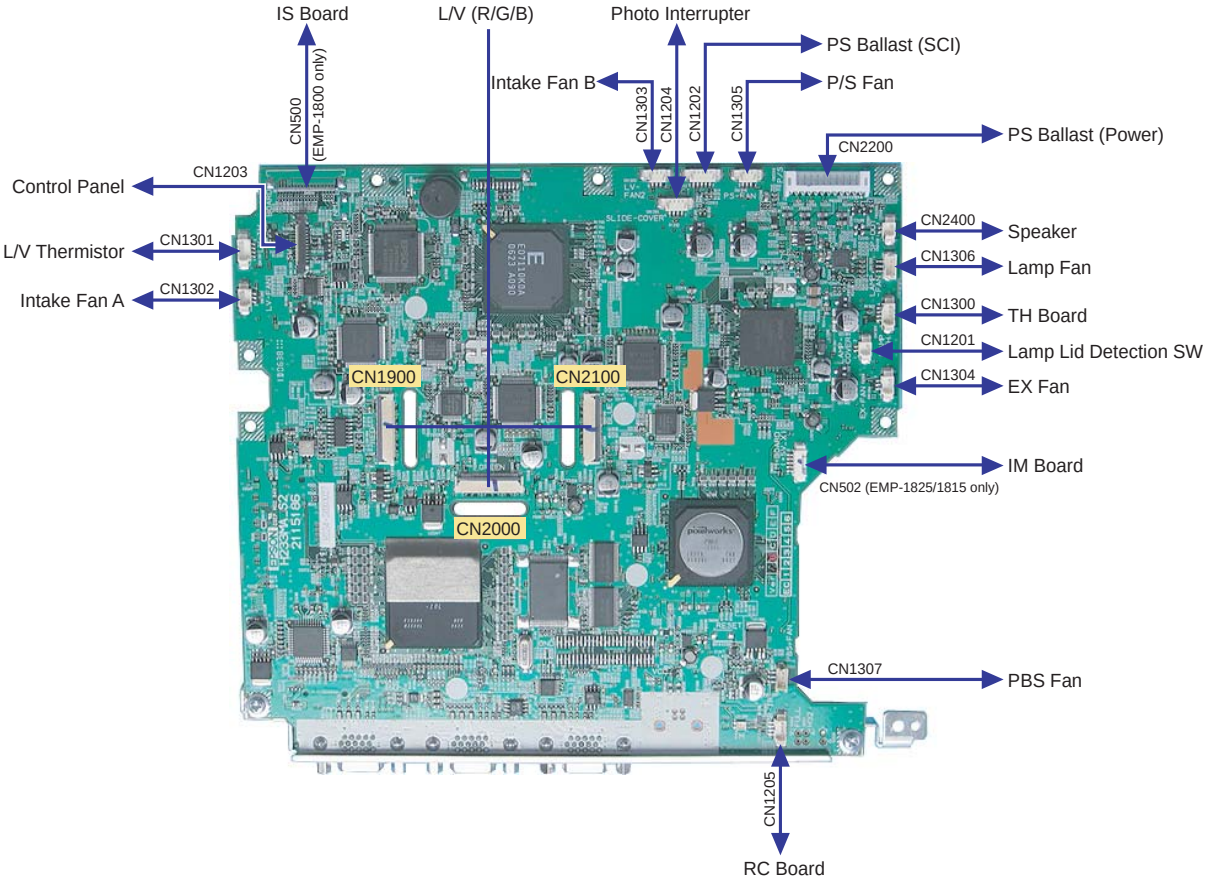


Figure 2-3. Control Circuit Connecting Diagram

2.2.2 Optical Engine

The Optical Engine consists of the Lamp Unit, the Light Guide Unit, the POP (Panel-on-Prism) Unit, and the projection lens.

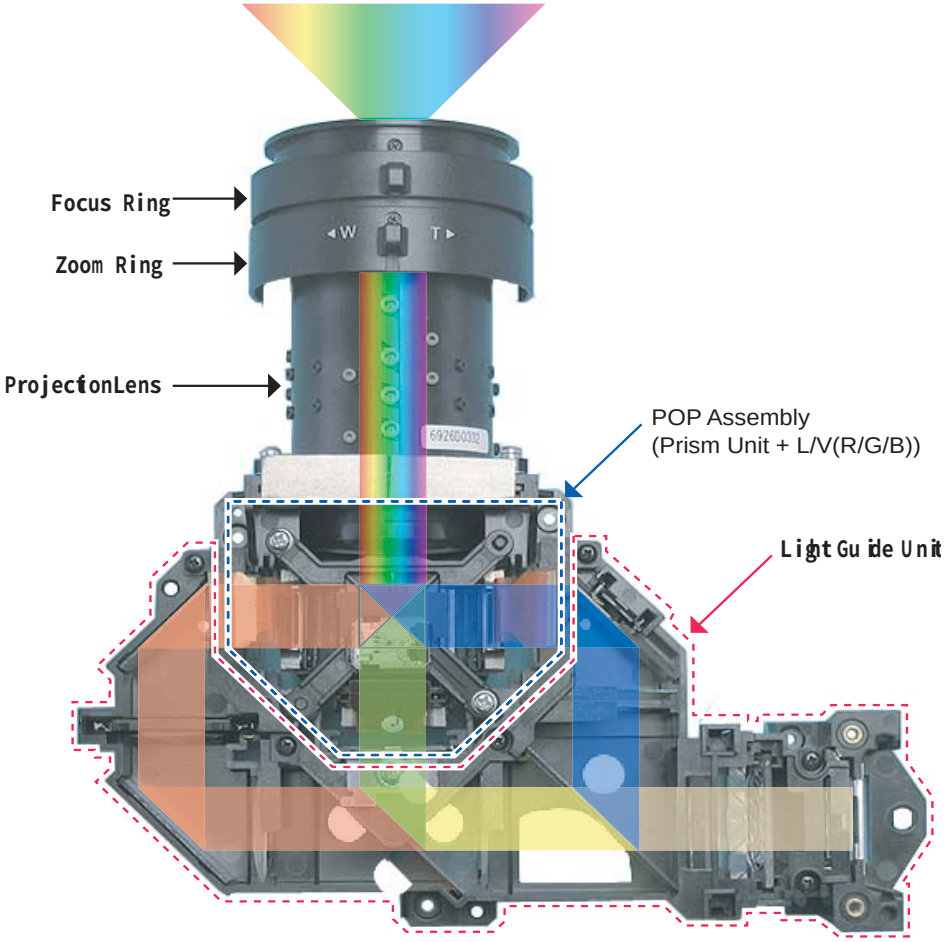


Figure 2-4. Optical Engine

Component Name	Function/Other	
Lamp Unit	An UHE-210W high-intensity discharge lamp is used as the light source.	
Light Guide Unit	In addition, a UV filter protects the LCDs from harmful ultraviolet light. After this light is polarized, it is then split into 3 spectrums (R, G and B).	
	Multi Lens Alley	Diffuses the light from the lamp to provide uniform illumination.
	Polarizer (PBS)	Polarizes the light and remove the U/V component harmful to the L/V.
	Dichroic Mirrors	Disperse the polarized light into the R/G/B spectrums.
POP Unit	The heart of the Optical Engine. Consists of the L/V (R/G/B) and the Prism Unit.	
	Light Valve (L/V)	Controls the intensity of the distributed components of the RGB light.
	Prism Unit	Integrates the RGB light
Projection lens	Sends the integrated light onto the screen. Two adjustment rings are mounted: the Zoom Ring to scale the projected image, and the Focus Ring to focus the lens.	

2.3 Temperature Control

The internal temperature of this projector is monitored by the sensors (the Lamp thermistor, L/V thermistor) in order to protect the projector from internal overheat, which may cause unsafe state or damage to the projector. The fans' revolutions are controled according to the detected temperature data. The fans' revolutions are altered by changing the driving voltage based on the detected data. In this way, the ventilation level is optimaized and the internal temperature is kept stablized.

2.3.1 Sensors and Switches

The fans and sensors mounted in this product, and the routes of air flow are shown below.

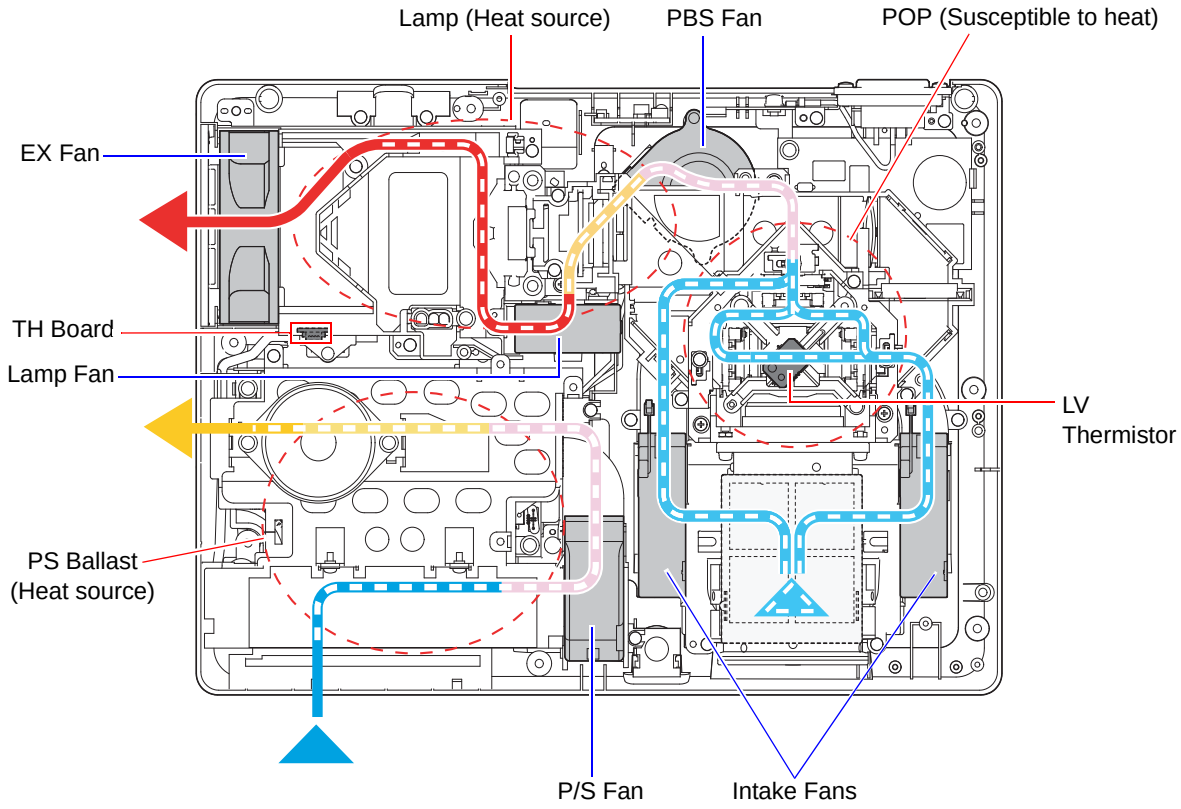


Figure 2-5.

Part Name	Function
Intake Fan A/B	Take in fresh air from the intake duct (with Air Filter) located in the bottom of the projector, and supply it to the Light Valves R/G/B.
P/S Fan	Ventilates the circuit boards of the PS Ballast Assy.
Lamp Fan	Ventilates the inside of the Lamp Unit.
PBS Fan	Ventilates the PBS (Polarizer) of the Optical Engine.
EX Fan	Exhausts the heated air generated inside the projector to the outside.

Chapter 3 Troubleshooting

3.1 Before Carrying Out Troubleshooting

- If repairs involving the replacement of parts or components have been carried out, always be sure to re-check whether the replacement parts themselves are operating correctly or not in order to determine whether the problem is the result of something such as a loose connector.
- All instructions and procedures listed in troubleshooting flowcharts should be carried out as given.
- Follow the procedures given in Chapter 4 Disassembly and Assembly when replacing any of the projector components.
- When checking the operation of the projector, always check that the connectors are connected securely before proceeding to other checks.
- In order to confirm proper operation, use AC power from a normal source and use the correct cable type.

3.1.1 Troubleshooting Tools and Equipment

- The following tools and equipment will be required in order to carry out troubleshooting, and so you should check that they are on hand.

Table 3-1.

Name	Quantity	Application/Other
Projection screen	1	Projecting images
Tape measure (3 m)	1	Measuring projection distances
Host computer	1	Transmitting audio and image data
USB mouse	1	Checking the operation of the mouse
Video equipment	1	Transmitting audio and image data
Multi meter	1	Measuring resistance values and voltages (AC/DC)
Double-sided tape	Short length	Attaching parts
General tools	1 set	Tools and equipment listed in Section 4.1

3.2 Basic Information on Troubleshooting

This section describes basic information needed when executing the troubleshooting.

3.2.1 LED Indicators

The control panel has three LEDs that indicate the operating status of the projector.

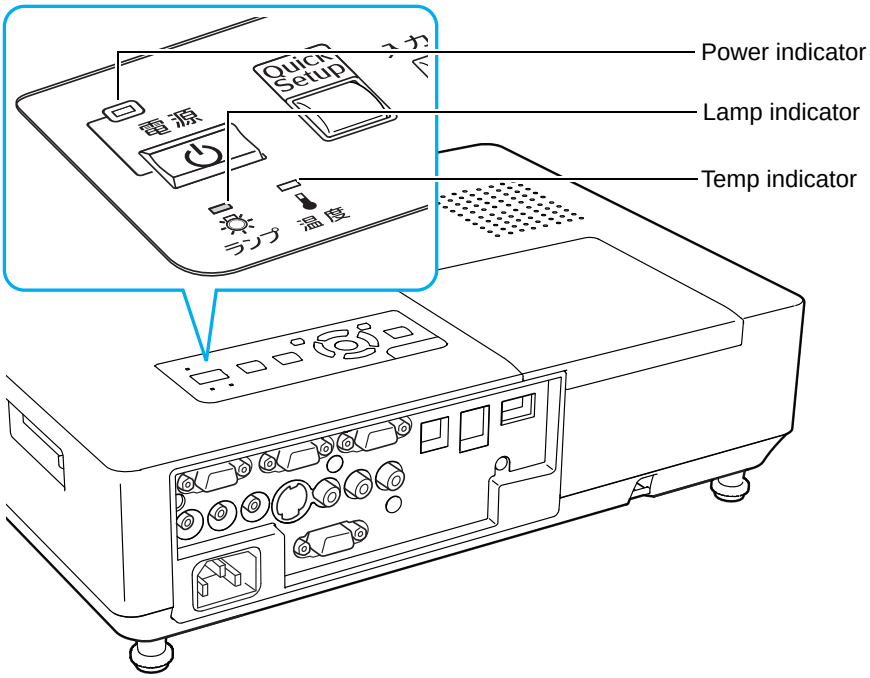


Figure 3-1 LED Indicators

The following tables show what the indicators mean and how to remedy any problem indicated.

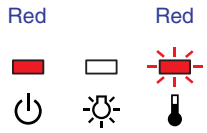
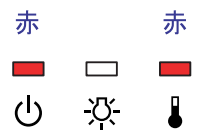
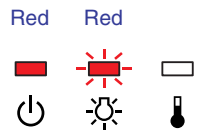
☐ Power indicator lights red: Abnormal

■ ON ☼ Blink □ OFF

Table 3-2. LED Indicator Status (Error)

Indicator Status	Projector Status	Problem and Remedy
Red Red Red	Internal Error	[**Status**] Abnormality is detected from any of the following elements on the MA board. • ROM Error • RAM Error • I2C Error • DR Status Error • Sub System ROM Error • Sub System Communication Error [**Remedy**] Disconnect the AC cable once, and reconnect it, then turn the power on. If the same error occurs, replace the Optical Engine and MAB set because the MA board is broken. (refer to 4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20) / 4.4.3 "Removing the Optical Engine and MAB (2) (Optical Engine)" (p. 42))

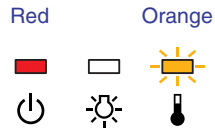
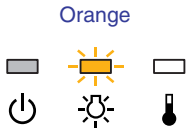
Table 3-2. LED Indicator Status (Error)

Indicator Status	Projector Status	Problem and Remedy
	Fan Error Sensor Error	[**Status**] Abnormality is detected from any of the fans or the sensors mounted on the projector. (Fan's abnormality: irregular revolution/disconnection, Sensor's abnormality: irregular value detected/disconnection) [**Remedy**] Check the connections between the fans/sensors and the MA board. If the same error occurs after improvement, replace the Optical Engine and MAB set because the MA board is broken. (refer to 3.2.2 "Cable Connection and Projector's Status" (p. 6) / 4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20) / 4.4.3 "Removing the Optical Engine and MAB (2) (Optical Engine)" (p. 42))
	High Temp Error (overheating)	[**Phenomenon**] The lamp turns off automatically, and the projection stops. Left the projector for 5 minutes untouched, it switches to the standby mode. [**Status**] The internal temperature rises over the specified level. (The TH sensor detects overheating.) (refer to 3.3.2 "Abnormality Check" (p. 10)) [**Remedy**] Check the Air Filter's condition (dirt accumulation, clogging) When clogging or the like is found, clean/replace the filter. (refer to 4.3.2 "Removing the Air Filter Assy." (p. 11))
	Lamp problem Lamp failure Lamp cover is open	[**Status**] Abnormality occurs to the lamp and the ignition/illumination processes fail, or the Lamp Lid is not securely closed. [**Remedy**] Check the following one by one. After checking and improving, turn on the power again and check if the same error occurs again. • Whether the Lamp Lid is securely fixed. Check the Lamp Lid, and fix it securely if it is loose/open. • Whether the lamp is securely fixed. Check the lamp and fix it securely if it is loose.
		• Whether the lamp is broken/damaged. Take out and check the lamp for damage. If the lamp is not cracked: Re-fit the lamp and turn on the power. If the error continues, replace the lamp with a new one. If the lamp is broken/damaged, replace it with a new one. (refer to 4.3.1 "Removing the AS Lamp Unit" (p. 10))
		• The Air Filter's condition (dirt accumulation, clogging) When clogging or the like is found, clean/replace the filter. (refer to 4.3.2 "Removing the Air Filter Assy." (p. 11))
		When using the projector at an altitude of 1500 m or more, set "High Altitude Mode" to "On"

☐ Lamp or Temp indicator flashes orange: Warning

ON Blink OFF Varies according to the projector status

Table 3-3. LED Indicator Status (Warning)

Indicator Status	Projector Status	Problem and Remedy
	High Temp Warning	(This is not an abnormality. However, if the temperature rises too high again, projection stops automatically.) • Check that the air filter and air exhaust vent are clear, and that the projector is not positioned against a wall. • If the air filter is clogged, clean or replace it. (refer to 3.3.2 "Abnormality Check" (p. 10) / 4.3.2 "Removing the Air Filter Assy." (p. 11))
	Replace Lamp	Replace it with a new lamp. If you continue to use the lamp after the replacement period has passed, the possibility that the lamp may explode increases. Replace it with a new lamp as soon as possible. (refer to 4.3.2 "Removing the Air Filter Assy." (p. 11))

3.2.2 Cable Connection and Projector's Status

The projector's status when disconnection occurs somewhere is described below.
When some irregular status is seen, refer to the following table and check the doubted connectors are securely connected. If there is a disconnection or a loose connection, connect it firmly. (For the procedure to remove the Upper Case, refer to 4.3.4 "Removing the IF-IM Case/Upper Case Unit AJ" (p. 13))

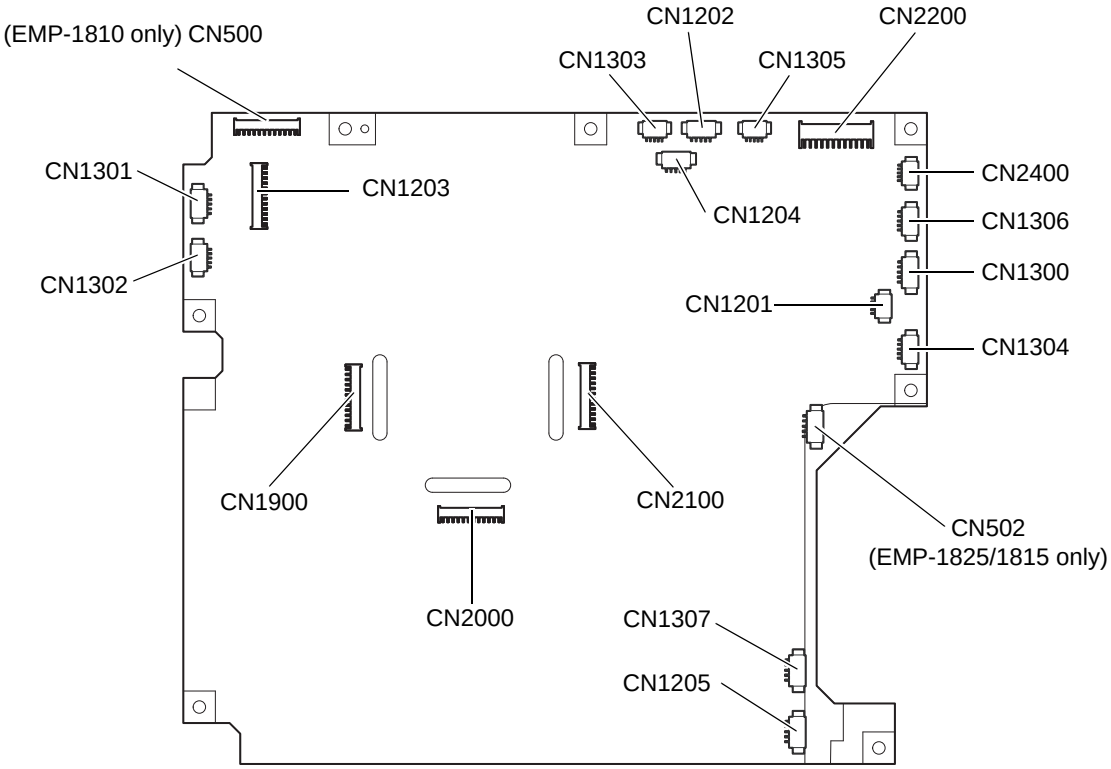


Figure 3-2 Connectors on the MA board

Table 3-4. Mal-connection and the Projector's Status

Connection (Common to EMP-1825/1815/1810)		Status
MA board	Connected to	
CN1900	Optical Engine (L/V(R))	The power can turn on and the projection starts. But the projected image is all red or magenta (with a red frame).
CN2000	Optical Engine (L/V(G))	The power can turn on and the projection starts. But the projected image is all green or cyan (with a green frame).
CN2100	Optical Engine (L/V(B))	The power can turn on and the projection starts. The projected image is all blue, but this error cannot be easily found since the default window is the same color. Check the color of the menu window.
CN2200	PS Ballast (PS)	Even if the AC cable is connected, the power indicator is not lit. The power button does not work. (the same status as CN1203 Control Panel)
CN2400	Speaker	The power can turn on and the projection starts normally. But no sound is output from the speaker even if the audio input is applied.

Table 3-4. Mal-connection and the Projector's Status

CN1201	Lamp Lid Detection SW	The power can turn on and the projection starts, but instantly the projector changes to the Lamp Error mode. (refer to 3.2.1 "LED Indicators" (p. 3)) The power turns off after a certain period of cooling. But the error message continues to be on.
CN1202	PS Ballast (SCI)	The power can turn on and the power indicator blinks, but the lamp is not ignited, so no image is projected. After a while, the projector changes to the Lamp Error mode. (refer to 3.2.1 "LED Indicators" (p. 3)) The power turns off after a certain period of cooling. But the error message continues to be on.
CN1203	Control Panel	Even if the AC cable is connected, the power indicator is not lit. The power button does not work. (the same status as CN2200 PS Ballast (PS))
CN1204	Photo Interrupter	The power can turn on and the projection starts normally. But even if the lens shutter is closed, the projection continues fully and the lamp keeps on. The AV mute function does not work when the shutter is closed, so the sound continues to be on. If the shutter kept closed, it may be deformed or damaged, so be careful. • Note: The control of AV Mute from the Remote Controller is effective.
CN1205	RC board	The power can turn on and the projection starts normally. But the control from the rear does not function. The control from the front is still effective, so if the RC's signal reflects from the screen, the control from the rear might be effective. When checking, send the signal to the back of the projector only. Otherwise, this error can be easily slipped over, so be careful. • Note: The setting of the RC receivers (active/inactive) is available from the menu. So, check the setting of the corresponding receiver before applying the remedy.
CN1300	TH board	The power can turn on and the projection starts, but instantly the projector changes to the Fan/Sensor Error mode. (refer to 3.2.1 "LED Indicators" (p. 3)) The power turns off after a certain period of cooling. But the error message continues to be on.
CN1301	L/V thermistor	
CN1302	Intake Fan A	
CN1303	Intake Fan B	
CN1304	Exhaust Fan	
CN1305	P/S Fan	
CN1306	Lamp Fan	
CN1307	PBS Fan	
Connection (EMP-1810 only)		**Status**
MA board	**Connected to**	
CN500	IS board	The power can turn on and the projection starts normally. If the [QuickSetup] button is pressed, the Quick Setup function does not work, instead, the message that the measurement of Quick Setup is unavailable and ask to check the setting of the projector is displayed. The control from the rear does not function. The control from the front is still effective. • (Note: The setting of the RC receivers (active/inactive) is available from the menu. So, check the setting of the corresponding receiver before applying the remedy.
IS board	**Connected to**	
CN10	MA board	

Table 3-4. Mal-connection and the Projector's Status

Connection (EMP-1825/1815 only)		Status
MA board	**Connected to**	
CN502	IM board	The power can turn on and the projection starts normally. On the bottom left, the message that EasyMP is starting continues to be displayed for a few minutes. But the menu button works normally. Then, the message that something happens to EasyMP and ask to press [?] for help is displayed.
IM board	**Connected to**	
CN1303	MA board	
CN801	USB board	The power can turn on and the projection starts normally. If the projector is connected to the network with the wireless LAN unit, the projector cannot be recognized. But if the wireless LAN unit is not used, this error can be slipped over, so be careful.
CN1300	IS board	The power can turn on and the projection starts normally. If the [QuickSetup] button is pressed, the Quick Setup function does not work, instead, the message "The measurement of Quick Setup cannot be done. Please check the setting of the projector." is displayed. The control from the rear does not function. The control from the front is still effective. • (Note: The setting of the RC receivers (active/inactive) is available from the menu. So, check the setting of the corresponding receiver before applying the remedy.
IS board	**Connected to**	
CN10	IM board	

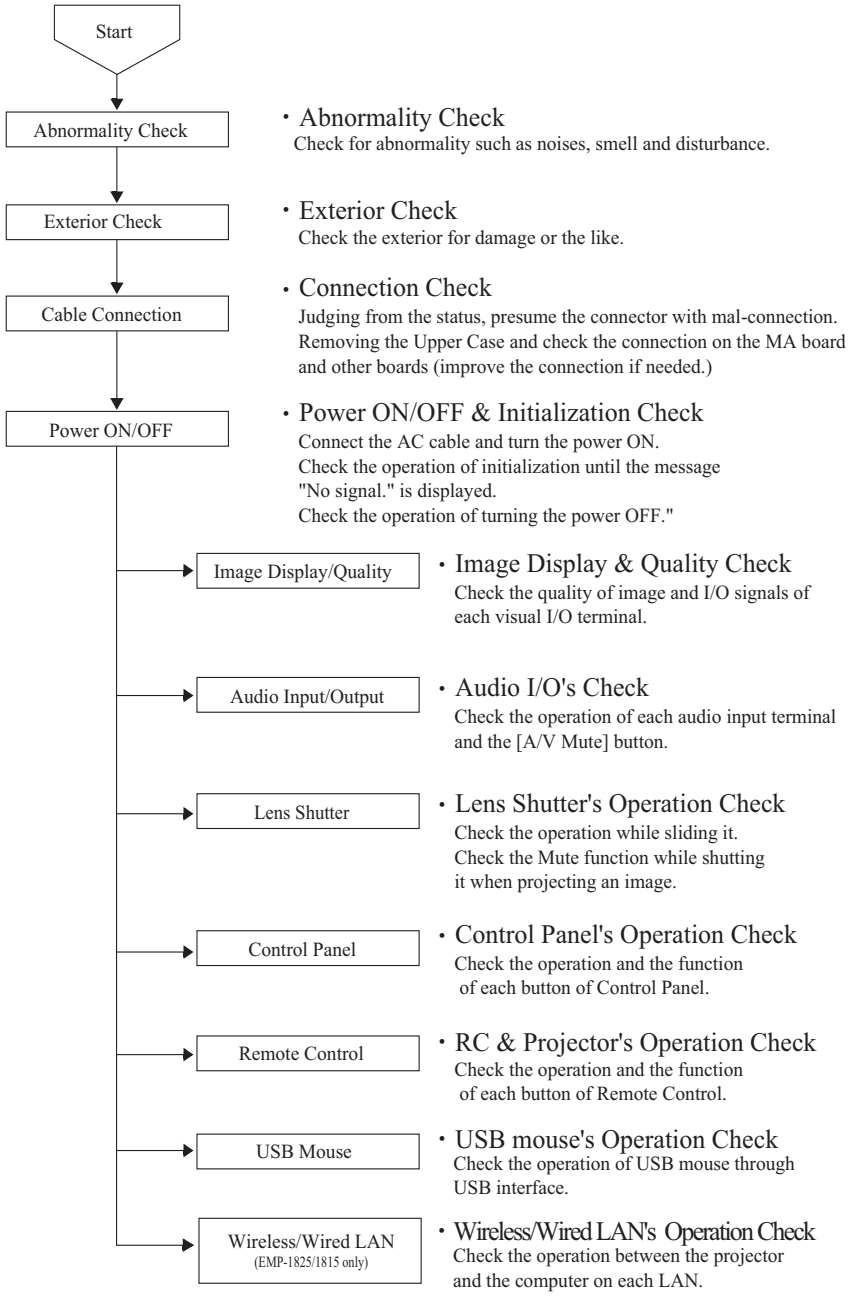
3.3 Troubleshooting

Following the Basic Checking Flowchart below, check the trouble and refer to the flowchart corresponding to it (the charts are provided from the next page).

CAUTION

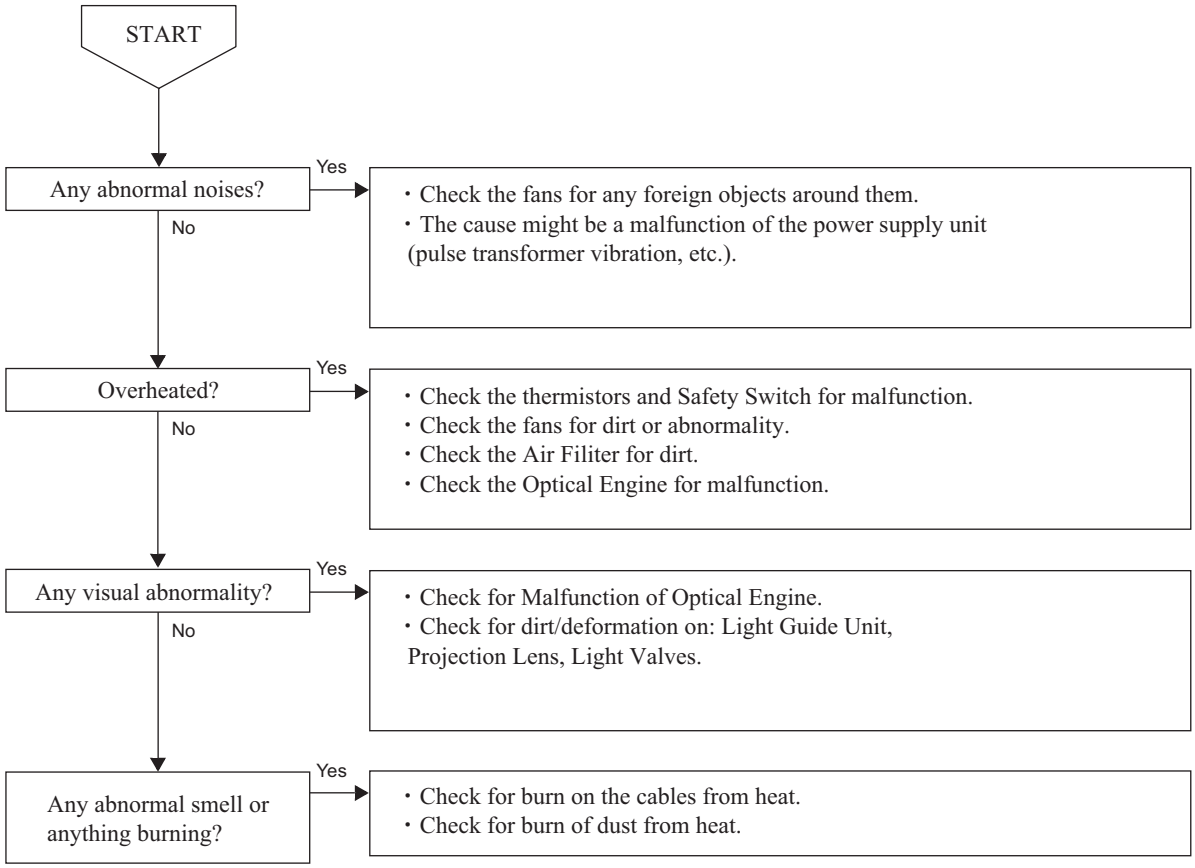
If the Optical Engine and MAB set and/or the IS board assy. is/are replaced as the remedy, be sure to refer to the Chapter 5 "Adjustment" (p. 1) and make the corresponding adjustment.

3.3.1 Basic Checking Flowchart


Start
Abnormality Check
Exterior Check
Cable Connection
Power ON/OFF
Image Display/Quality
Audio Input/Output
Lens Shutter
Control Panel
Remote Control
USB Mouse
Wireless/Wired LAN
(EMP-1825/1815 only)
・Abnormality Check
Check for abnormality such as noises, smell and disturbance.
・Exterior Check
Check the exterior for damage or the like.
・Connection Check
Judging from the status, presume the connector with mal-connection.
Removing the Upper Case and check the connection on the MA board
and other boards (improve the connection if needed.)
・Power ON/OFF & Initialization Check
Connect the AC cable and turn the power ON.
Check the operation of initialization until the message
"No signal." is displayed.
Check the operation of turning the power OFF."
・Image Display & Quality Check
Check the quality of image and I/O signals of
each visual I/O terminal.
・Audio I/O's Check
Check the operation of each audio input terminal
and the [A/V Mute] button.
・Lens Shutter's Operation Check
Check the operation while sliding it.
Check the Mute function while shutting
it when projecting an image.
・Control Panel's Operation Check
Check the operation and the function
of each button of Control Panel.
・RC & Projector's Operation Check
Check the operation and the function
of each button of Remote Control.
・USB mouse's Operation Check
Check the operation of USB mouse through
USB interface.
・Wireless/Wired LAN's Operation Check
Check the operation between the projector
and the computer on each LAN.

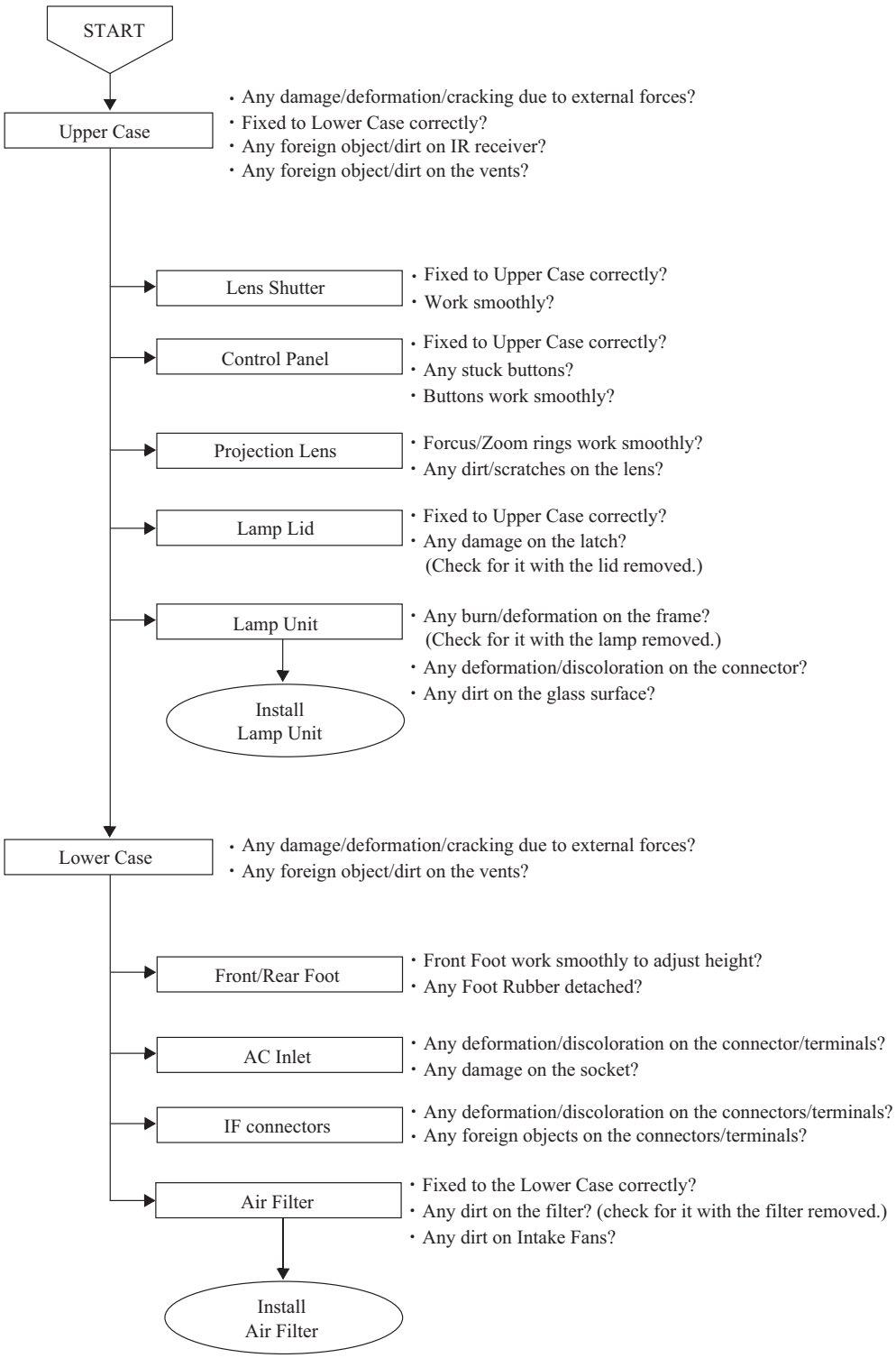
Flowchart 3-1 Basic Checking Flowchart

3.3.2 Abnormality Check


START
Any abnormal noises?
Yes
No
・Check the fans for any foreign objects around them.
・The cause might be a malfunction of the power supply unit (pulse transformer vibration, etc.).
Overheated?
Yes
No
・Check the thermistors and Safety Switch for malfunction.
・Check the fans for dirt or abnormality.
・Check the Air Filiter for dirt.
・Check the Optical Engine for malfunction.
Any visual abnormality?
Yes
No
・Check for Malfunction of Optical Engine.
・Check for dirt/deformation on: Light Guide Unit, Projection Lens, Light Valves.
Any abnormal smell or anything burning?
Yes
・Check for burn on the cables from heat.
・Check for burn of dust from heat.

Flowchart 3-2 Abnormality Check

3.3.3 Exterior Check


START
Upper Case
・Any damage/deformation/cracking due to external forces?
・Fixed to Lower Case correctly?
・Any foreign object/dirt on IR receiver?
・Any foreign object/dirt on the vents?
Lens Shutter
・Fixed to Upper Case correctly?
・Work smoothly?
Control Panel
・Fixed to Upper Case correctly?
・Any stuck buttons?
・Buttons work smoothly?
Projection Lens
・Forcus/Zoom rings work smoothly?
・Any dirt/scratches on the lens?
Lamp Lid
・Fixed to Upper Case correctly?
・Any damage on the latch?
(Check for it with the lid removed.)
Lamp Unit
・Any burn/deformation on the frame?
(Check for it with the lamp removed.)
・Any deformation/discoloration on the connector?
・Any dirt on the glass surface?
Install
Lamp Unit
Lower Case
・Any damage/deformation/cracking due to external forces?
・Any foreign object/dirt on the vents?
Front/Rear Foot
・Front Foot work smoothly to adjust height?
・Any Foot Rubber detached?
AC Inlet
・Any deformation/discoloration on the connector/terminals?
・Any damage on the socket?
IF connectors
・Any deformation/discoloration on the connectors/terminals?
・Any foreign objects on the connectors/terminals?
Air Filter
・Fixed to the Lower Case correctly?
・Any dirt on the filter? (check for it with the filter removed.)
・Any dirt on Intake Fans?
Install
Air Filter

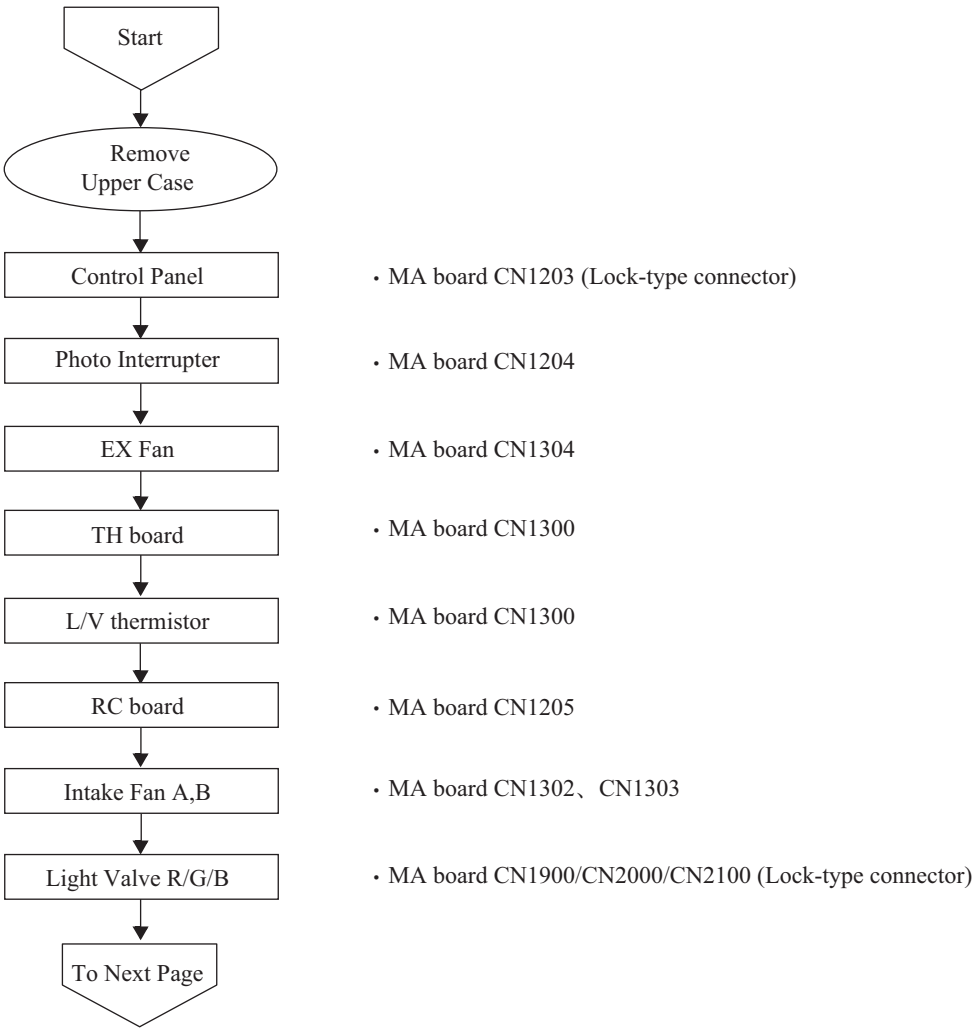
For more information, refer to 4.3.1 "Removing the AS Lamp Unit" (p. 10) / 4.3.2 "Removing the Air Filter Assy." (p. 11)

Flowchart 3-3 Exterior Check

3.3.4 Connection Check

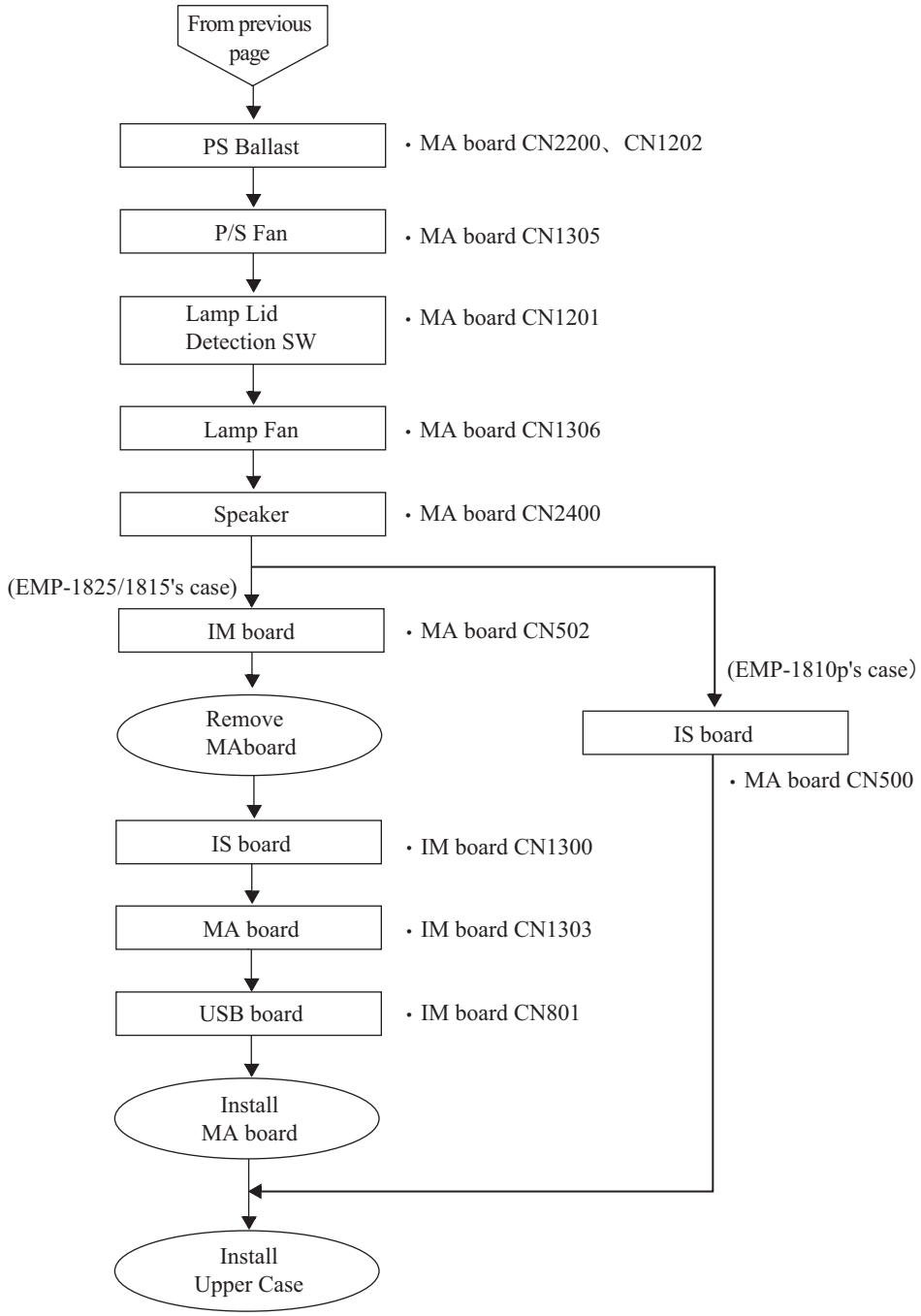
CAUTION

Before starting the checking work, be sure to turn off the power and detach the AC cable. (refer to 3.2.2 "Cable Connection and Projector's Status" (p. 6))



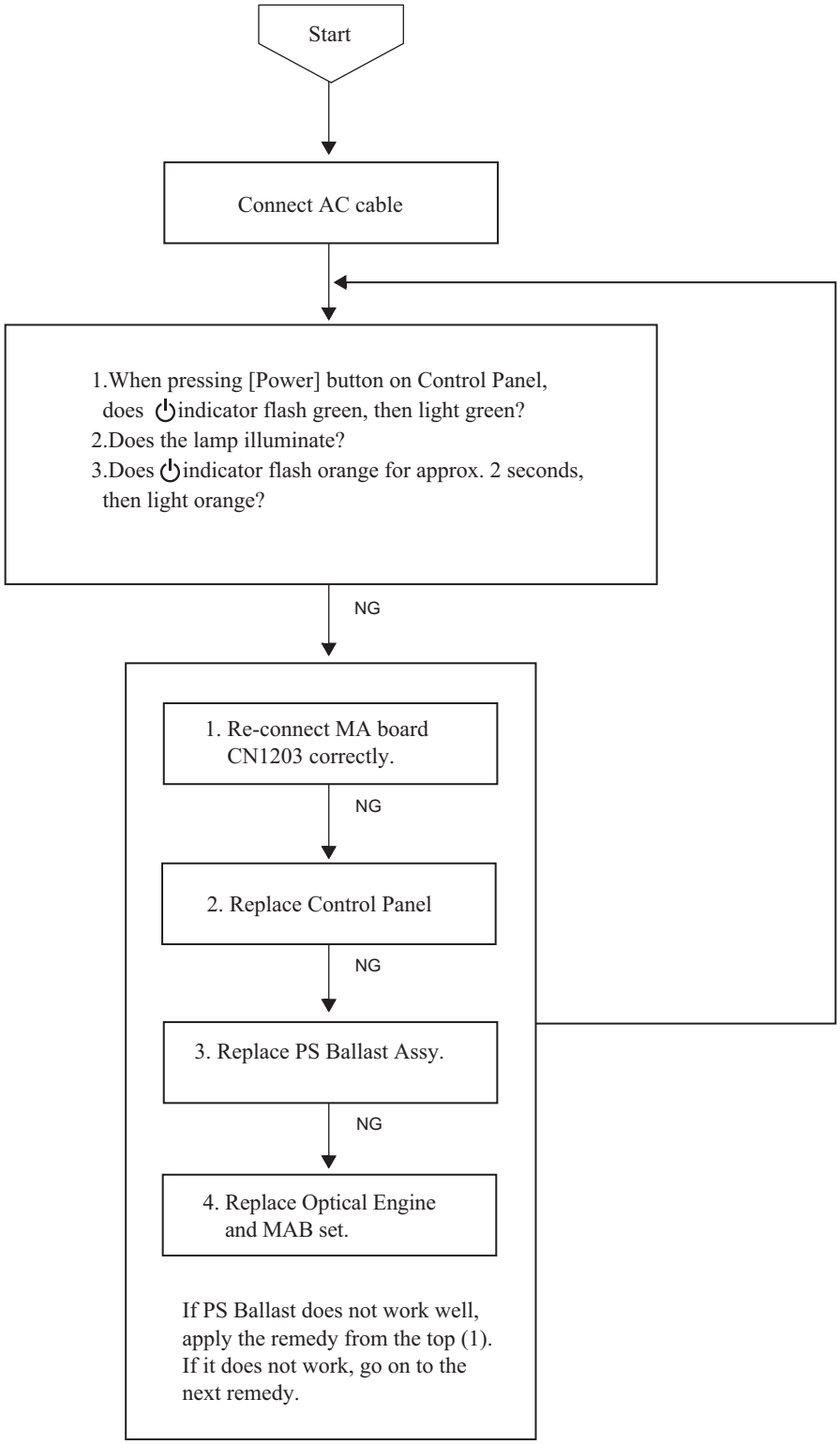
For more information, refer to 4.3.4 "Removing the IF-IM Case/Upper Case Unit AJ" (p. 13) / 4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20)

Flowchart 3-4 Connection Check (1)



Flowchart 3-5 Connection Check (2)

3.3.5 Power ON/OFF & Initialization Check


Start
Connect AC cable
1.When pressing [Power] button on Control Panel, does ⏻indicator flash green, then light green?
2.Does the lamp illuminate?
3.Does ⏻indicator flash orange for approx. 2 seconds, then light orange?
NG
1. Re-connect MA board CN1203 correctly.
NG
2. Replace Control Panel
NG
3. Replace PS Ballast Assy.
NG
4. Replace Optical Engine and MAB set.
If PS Ballast does not work well, apply the remedy from the top (1). If it does not work, go on to the next remedy.

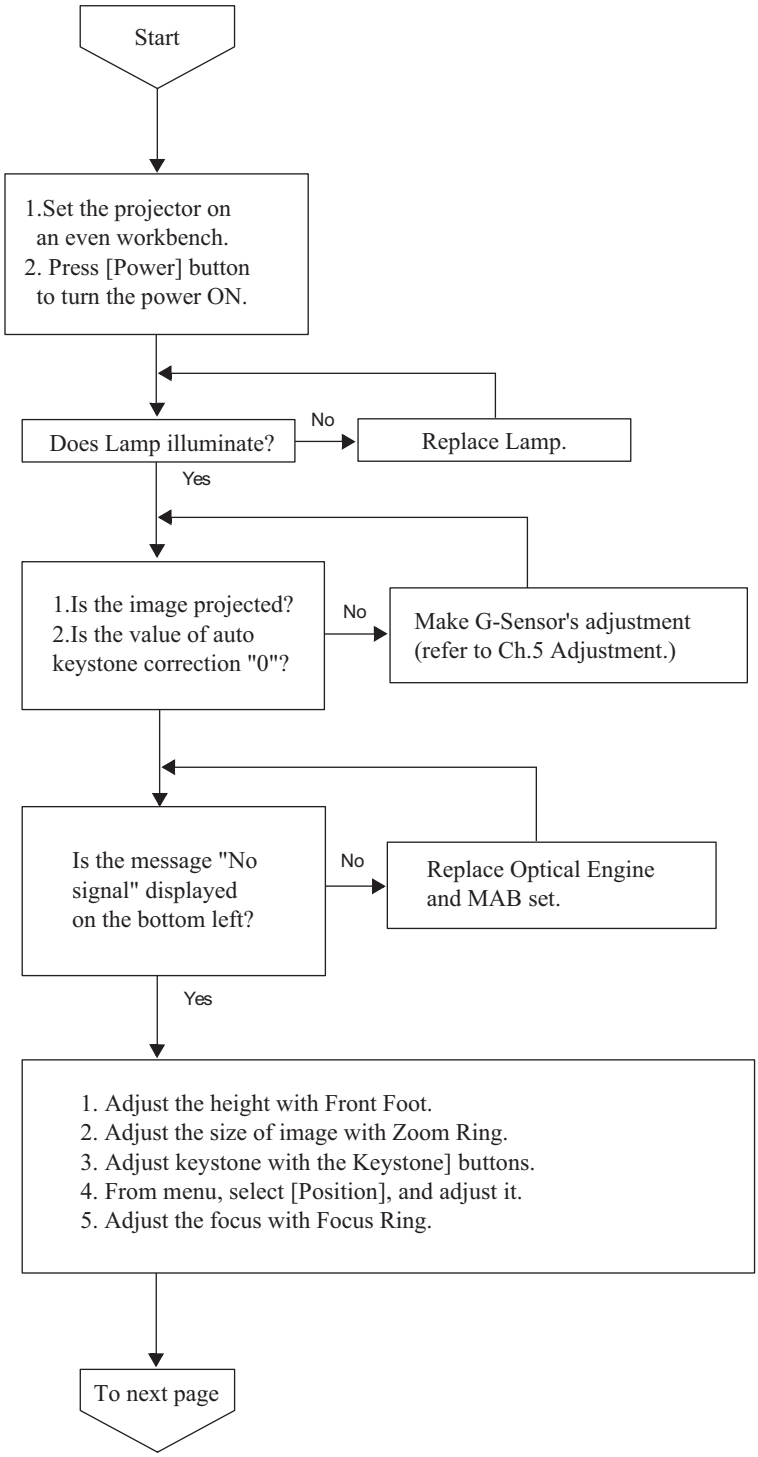
For more information, refer to 4.3.4.1. "Removing the Control Panel E/Lamp Lid Detection Switch" (p. 15) / 4.5.2 "Removing the PS Fan/PS Ballast Assy./Speaker" (p. 48) / 4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20) / 4.4.3 "Removing the Optical Engine and MAB (2) (Optical Engine)" (p. 42)

Flowchart 3-6 Power ON/OFF & Initialization Check

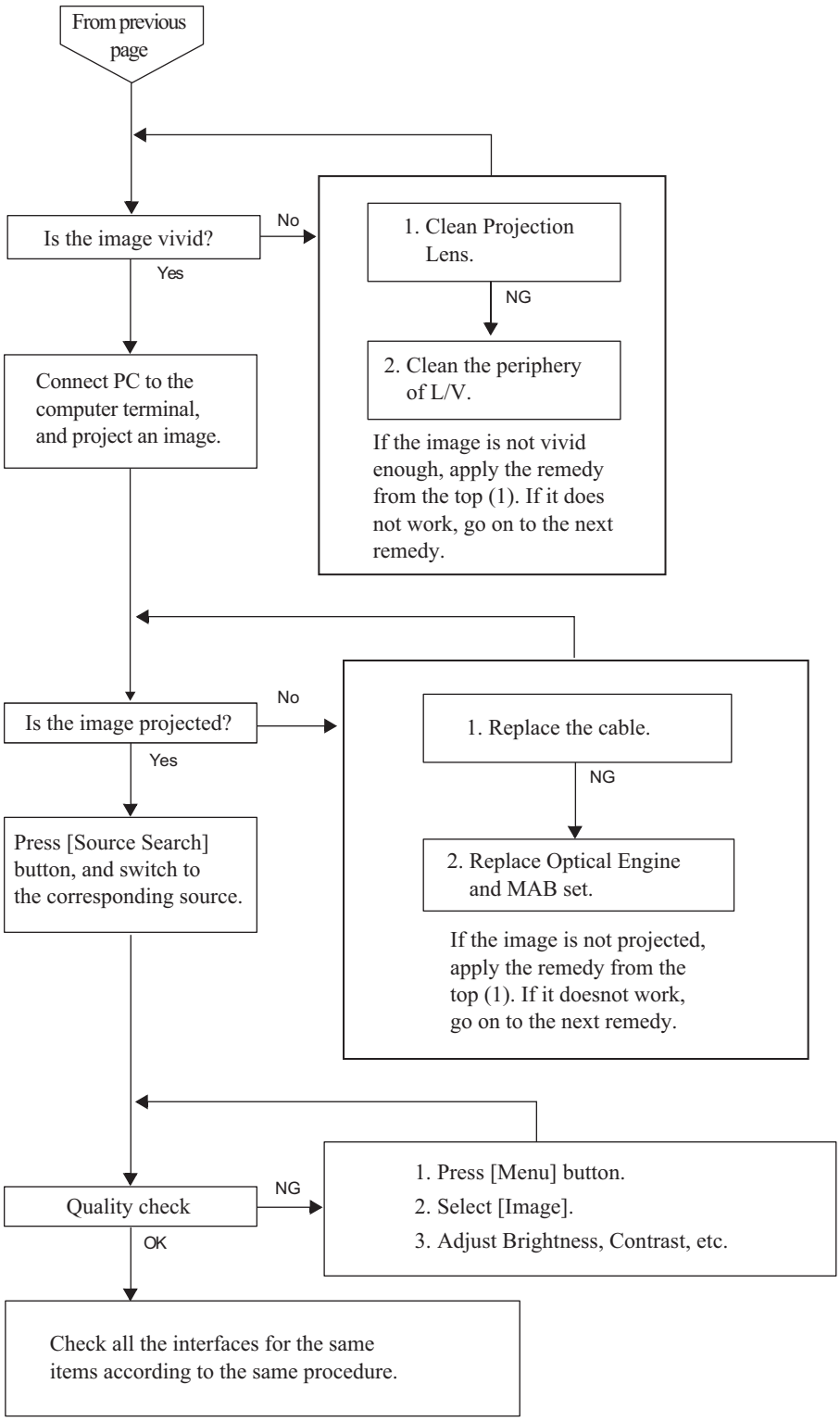
3.3.6 Image Display & Quality Check

CAUTION

The image quality can also be affected by condensation or by a dirty lens. If condensation forms, the problem will correct itself naturally if the projector is left to stand for a while.


Start
1.Set the projector on an even workbench.
2. Press [Power] button to turn the power ON.
Does Lamp illuminate?
No
Replace Lamp.
Yes
1.Is the image projected?
2.Is the value of auto keystone correction "0"?
No
Make G-Sensor's adjustment (refer to Ch.5 Adjustment.)
Is the message "No signal" displayed on the bottom left?
No
Replace Optical Engine and MAB set.
Yes
1. Adjust the height with Front Foot.
2. Adjust the size of image with Zoom Ring.
3. Adjust keystone with the Keystone] buttons.
4. From menu, select [Position], and adjust it.
5. Adjust the focus with Focus Ring.
To next page

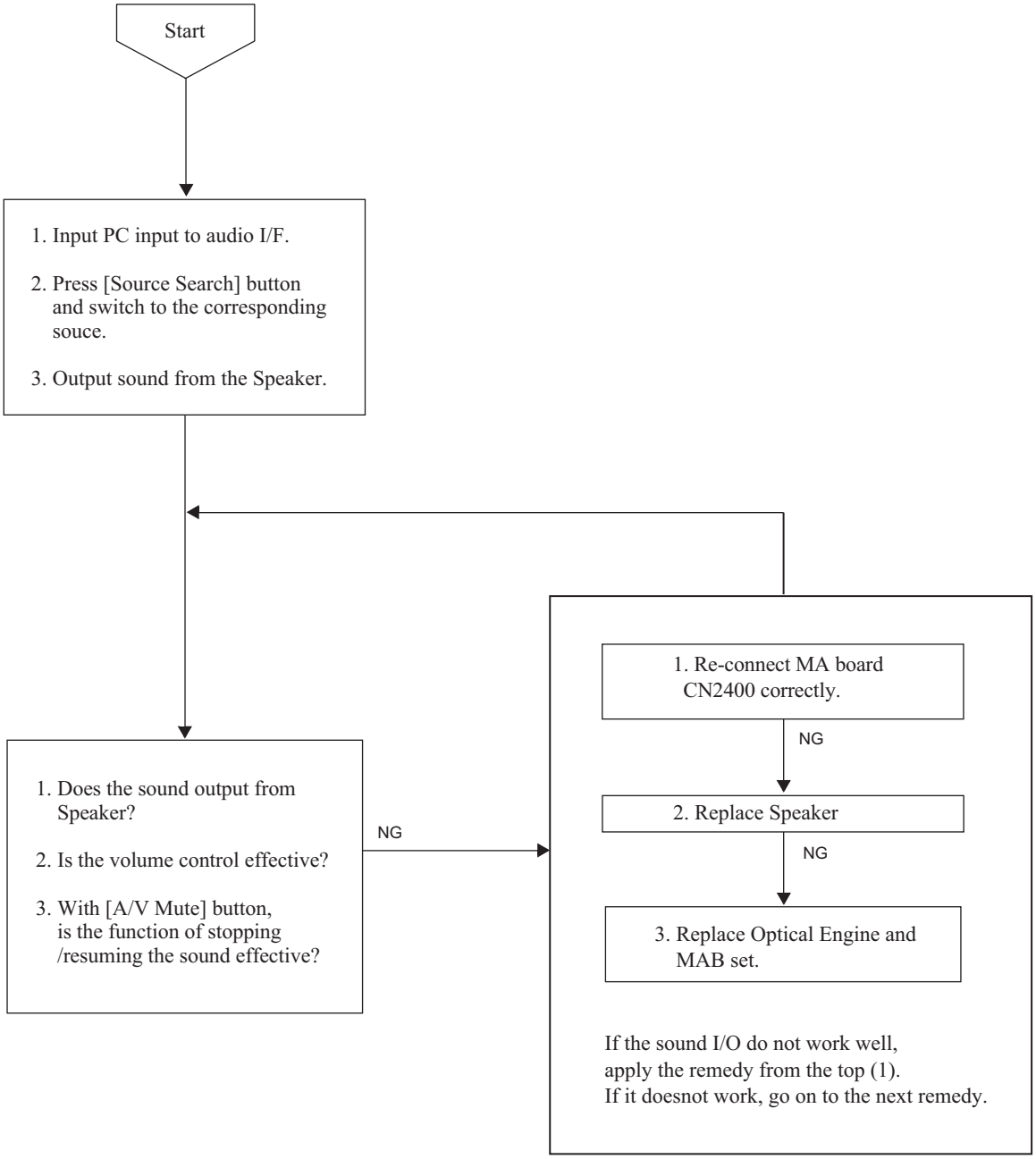
Flowchart 3-7 Image Display & Quality Check (1)


From previous page
Is the image vivid?
No
Yes
1. Clean Projection Lens.
NG
2. Clean the periphery of L/V.
If the image is not vivid enough, apply the remedy from the top (1). If it does not work, go on to the next remedy.
Connect PC to the computer terminal, and project an image.
Is the image projected?
No
Yes
1. Replace the cable.
NG
2. Replace Optical Engine and MAB set.
If the image is not projected, apply the remedy from the top (1). If it doesnot work, go on to the next remedy.
Press [Source Search] button, and switch to the corresponding source.
Quality check
NG
OK
1. Press [Menu] button.
2. Select [Image].
3. Adjust Brightness, Contrast, etc.
Check all the interfaces for the same items according to the same procedure.

For more information, refer to 4.3.1 "Removing the AS Lamp Unit" (p. 10) / 4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20) / 4.4.3 "Removing the Optical Engine and MAB (2) (Optical Engine)" (p. 42)

Flowchart 3-8 Image Display & Quality Check (1)

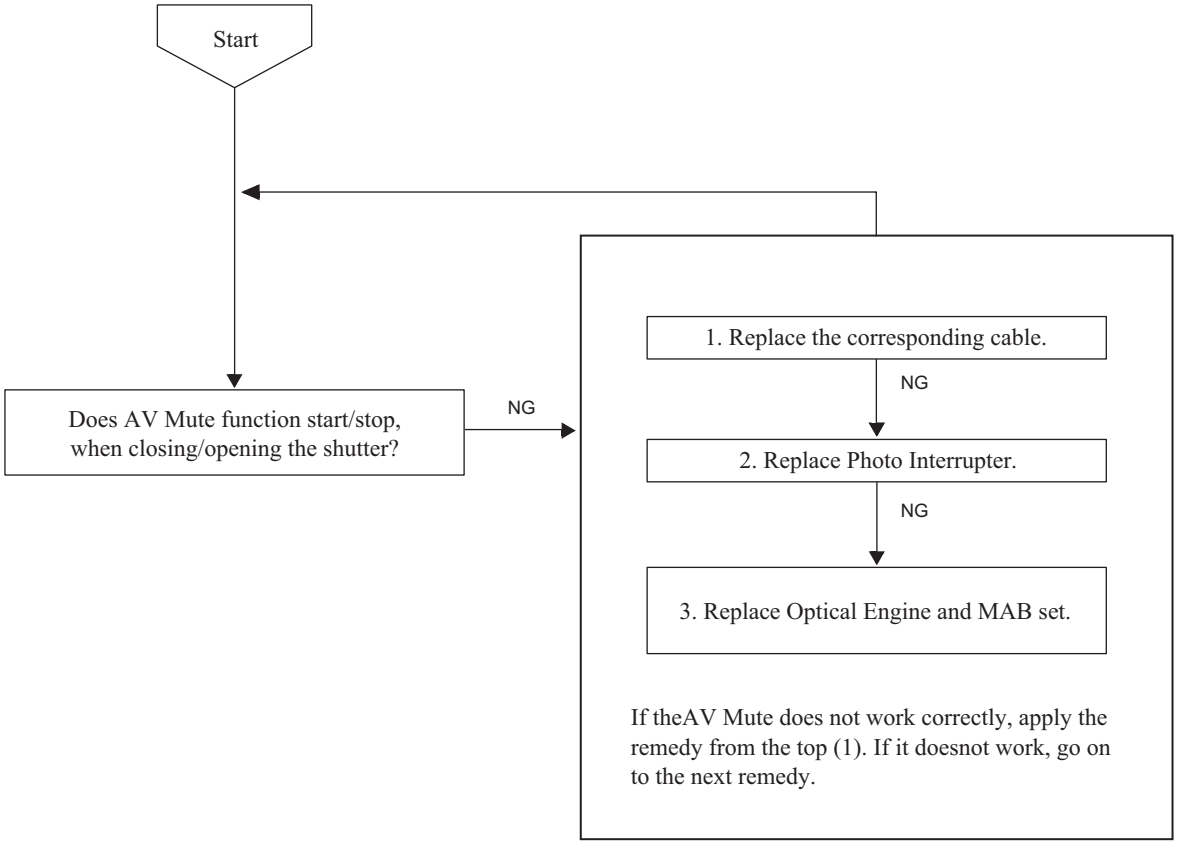
3.3.7 Audio I/O's Check


Start
1. Input PC input to audio I/F.
2. Press [Source Search] button and switch to the corresponding souce.
3. Output sound from the Speaker.
1. Does the sound output from Speaker?
2. Is the volume control effective?
3. With [A/V Mute] button, is the function of stopping /resuming the sound effective?
NG
1. Re-connect MA board CN2400 correctly.
NG
2. Replace Speaker
NG
3. Replace Optical Engine and MAB set.
If the sound I/O do not work well, apply the remedy from the top (1).
If it doesnot work, go on to the next remedy.

For more information, refer to 4.5.2 "Removing the PS Fan/PS Ballast Assy./Speaker" (p. 48) /4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20) / 4.4.3 "Removing the Optical Engine and MAB (2) (Optical Engine)" (p. 42)

Flowchart 3-9 Audio I/O's Check

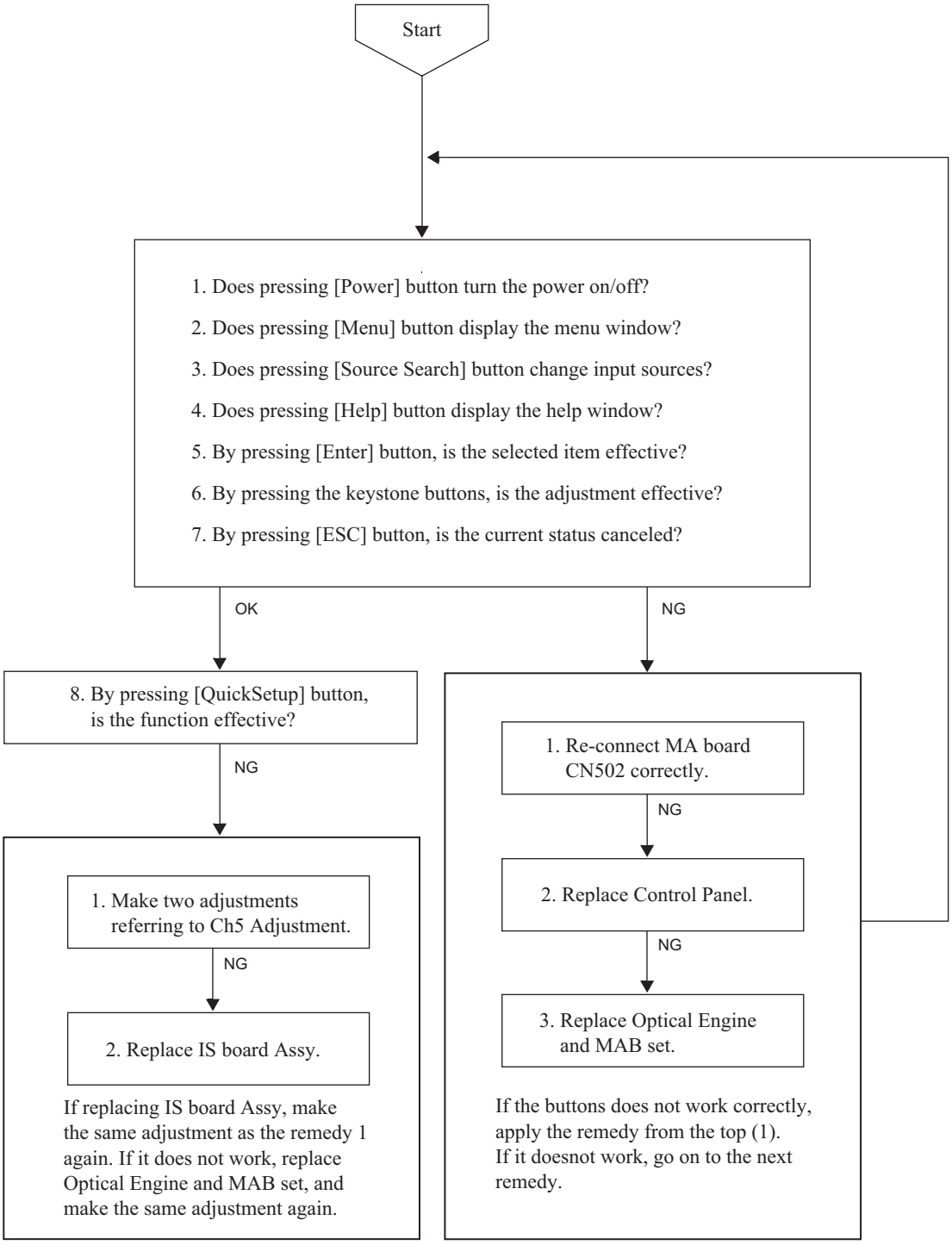
3.3.8 Lens Shutter's Operation Check


Start
Does AV Mute function start/stop, when closing/opening the shutter?
NG
1. Replace the corresponding cable.
NG
2. Replace Photo Interrupter.
NG
3. Replace Optical Engine and MAB set.
If theAV Mute does not work correctly, apply the remedy from the top (1). If it doesnot work, go on to the next remedy.

For more information, refer to 4.3.4.2. "Removing the Lens Shutter B/Lens Shutter A/Photo Interrupter" (p. 18) / 4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20) / 4.4.3 "Removing the Optical Engine and MAB (2) (Optical Engine)" (p. 42)

Flowchart 3-10 Lens Shutter's Check

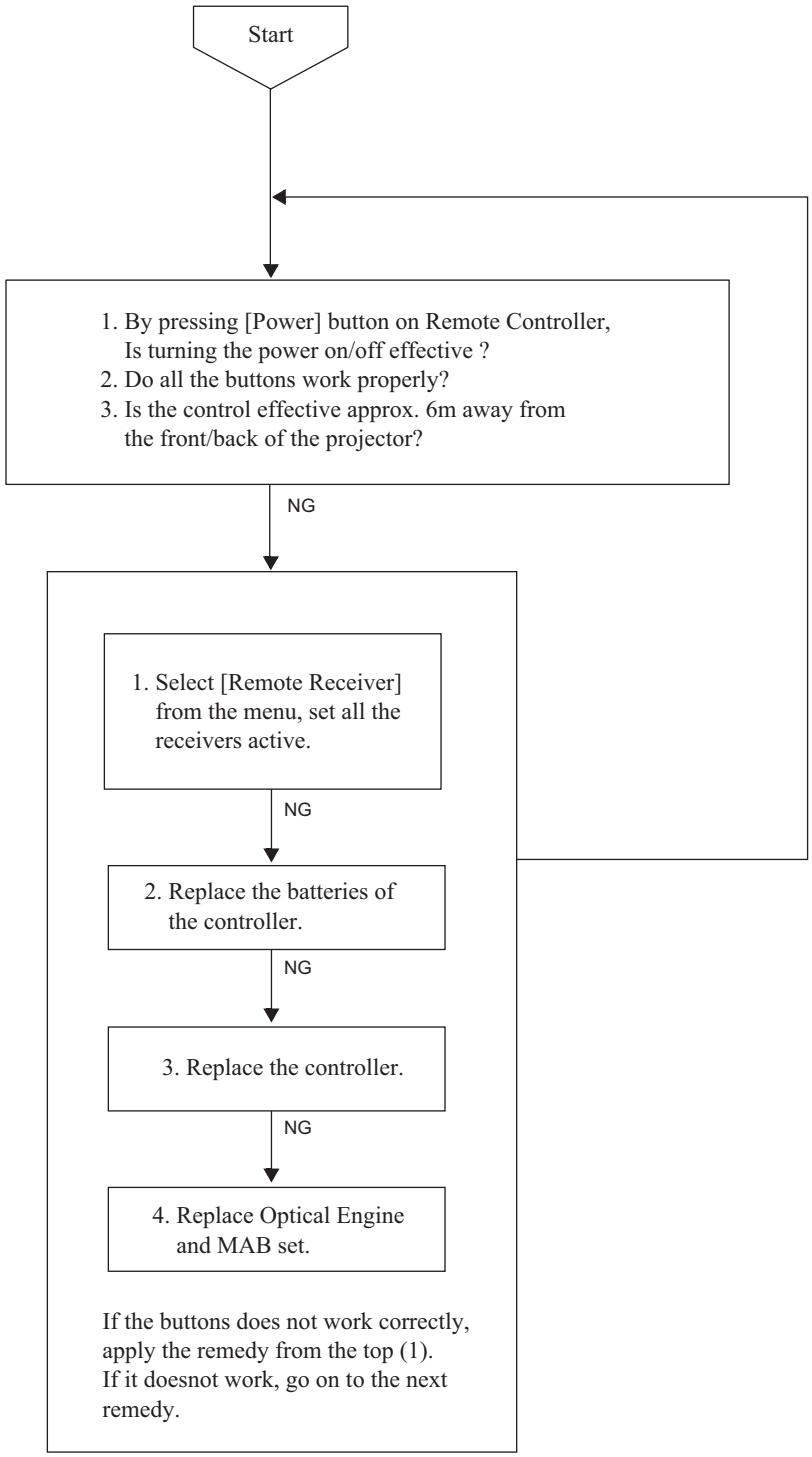
3.3.9 Control Panel's Operation Check


Start
1. Does pressing [Power] button turn the power on/off?
2. Does pressing [Menu] button display the menu window?
3. Does pressing [Source Search] button change input sources?
4. Does pressing [Help] button display the help window?
5. By pressing [Enter] button, is the selected item effective?
6. By pressing the keystone buttons, is the adjustment effective?
7. By pressing [ESC] button, is the current status canceled?
OK
NG
8. By pressing [QuickSetup] button, is the function effective?
NG
1. Make two adjustments referring to Ch5 Adjustment.
NG
2. Replace IS board Assy.
If replacing IS board Assy, make the same adjustment as the remedy 1 again. If it does not work, replace Optical Engine and MAB set, and make the same adjustment again.
1. Re-connect MA board CN502 correctly.
NG
2. Replace Control Panel.
NG
3. Replace Optical Engine and MAB set.
If the buttons does not work correctly, apply the remedy from the top (1). If it doesnot work, go on to the next remedy.

For more information, refer to 4.3.4.1. "Removing the Control Panel E/Lamp Lid Detection Switch" (p. 15)/4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20)/4.4.3 "Removing the Optical Engine and MAB (2) (Optical Engine)" (p. 42)/4.4.1.2. "Removing the SB Assy. IM*1 (IS Board Assy.*2)/IM Board Assy.*3 /CF Slot Assy.*3/USB Board Assy.*3" (p. 29)

Flowchart 3-11 Control Panel's Operation Check

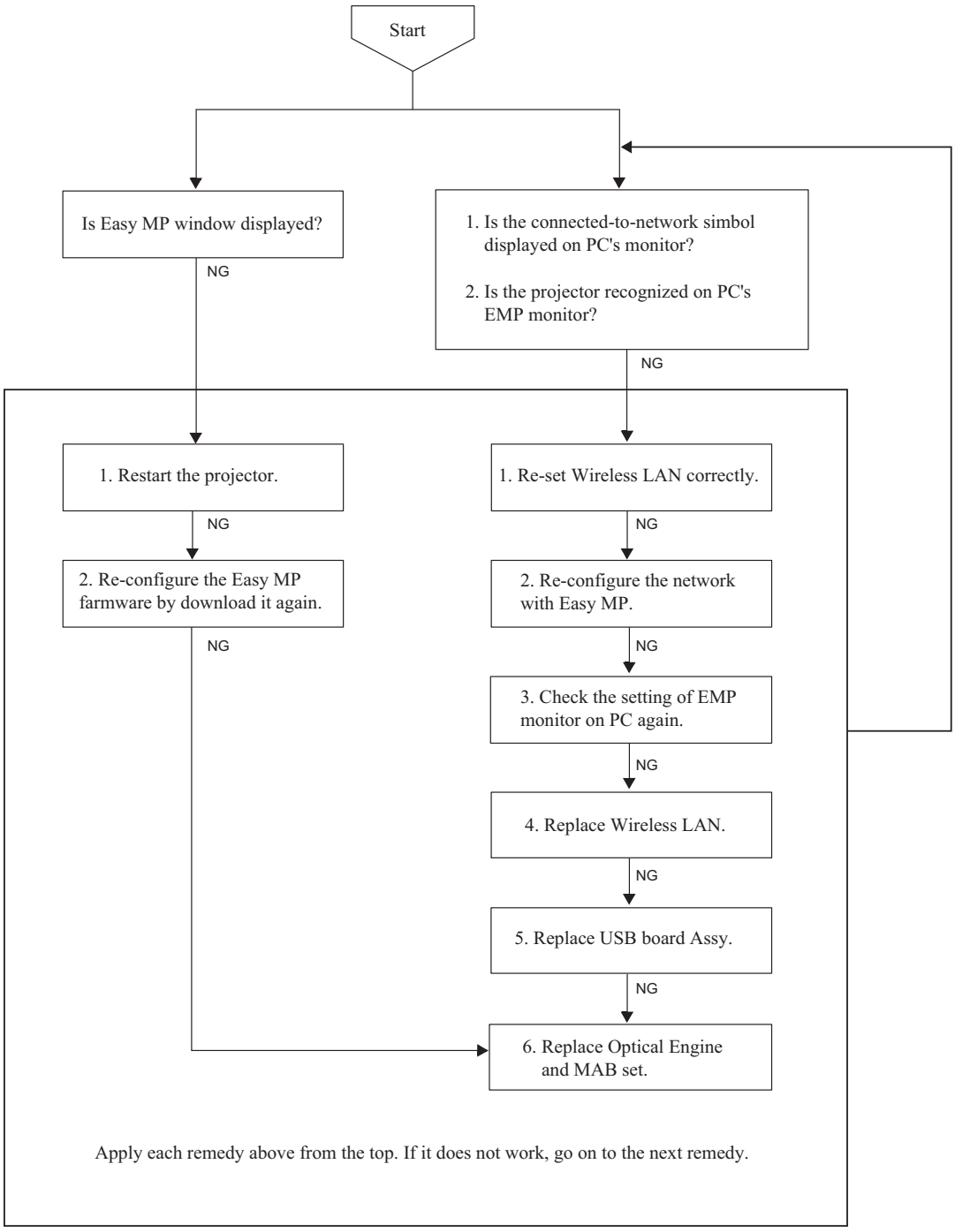
3.3.10 RC & Projector's Operation Check


Start
1. By pressing [Power] button on Remote Controller,
Is turning the power on/off effective ?
2. Do all the buttons work properly?
3. Is the control effective approx. 6m away from
the front/back of the projector?
NG
1. Select [Remote Receiver]
from the menu, set all the
receivers active.
NG
2. Replace the batteries of
the controller.
NG
3. Replace the controller.
NG
4. Replace Optical Engine
and MAB set.
If the buttons does not work correctly,
apply the remedy from the top (1).
If it doesnot work, go on to the next
remedy.

For more information, refer to 4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20) / 4.4.3 "Removing the Optical Engine and MAB (2) (Optical Engine)" (p. 42)

Flowchart 3-12 RC & Projector's Operation Check

3.3.11 Wireless/Wired LAN's Operation Check (EMP-1825/1815 only)


Start
Is Easy MP window displayed?
NG
1. Is the connected-to-network simbol displayed on PC's monitor?
2. Is the projector recognized on PC's EMP monitor?
NG
1. Restart the projector.
NG
2. Re-configure the Easy MP farmware by download it again.
NG
1. Re-set Wireless LAN correctly.
NG
2. Re-configure the network with Easy MP.
NG
3. Check the setting of EMP monitor on PC again.
NG
4. Replace Wireless LAN.
NG
5. Replace USB board Assy.
NG
6. Replace Optical Engine and MAB set.
Apply each remedy above from the top. If it does not work, go on to the next remedy.

For more information, refer to 4.4.1.2. "Removing the SB Assy. IM*1 (IS Board Assy.*2)/IM Board Assy.*3 /CF Slot Assy.*3/USB Board Assy.*3" (p. 29) / 4.4.1 "Removing the Optical Engine and MAB (1) (MA Board Assy.)" (p. 20) / 4.4.3 "Removing the Optical Engine and MAB (2) (Optical Engine)" (p. 42)

Flowchart 3-13 Wireless/Wired LAN's Operation Check (EMP-1825/1815 only)

Chapter 4 Disassembly/Assembly

4.1 Overview

This chapter describes the procedures for disassembling and assembling the main components of the EMP-1825/1815/1810 projector. Unless otherwise specified, reassembly is the reverse of the disassembly procedure. Read the precautions described in the next section before starting.

4.1.1 Precautions

Some procedures require specific precautions that must be followed, and those will be noted throughout this chapter. Note the following precaution definitions:

WARNING

Procedures which, if not strictly observed, could result in personal injury are described under the heading **WARNING**

CAUTION

CAUTION signals a precaution which, if ignored, could result in damage to equipment.

REASSEMBLY

If assembly needs special attention or the procedure is different from the reversed disassembly procedure, the correct procedure is described under the heading **REASSEMBLY**.

CHECK POINT

Important tips for procedures are described under the heading **CHECK POINT.**

4.1.2 Precautions which must be taken when servicing

The precautions given below must be always observed whenever you disassemble/reassemble the projector to maintain the quality. Make sure to also observe the WARNING and CAUTION precautions given in each section describing disassemble/reassemble procedure of each unit or component in this chapter.

- When the projector is disassembled, the dust in and around parts such as the fans and air filter may get transferred to other parts such as the R, G and B light valves which are the central part of the display mechanism. This may have an adverse effect on the quality of projected images. Accordingly, check whether any of the parts are dusty or dirty, and use a vacuum cleaner to clean them first before carrying out disassembly work.
- The Optical Engine and the circuit boards are very sensitive to static electricity. Place them inside static-proof bags once they have been removed from the projector.
- When carrying out any of the following operations, check that there is no dust or dirt on the respective components or on any lens and glass surfaces before installation. If any such contamination is found, clean it off using isopropyl alcohol.
  - Optical Engine removal
  - Lamp assembly removal
  - Air filter removal

- The speaker unit contains a permanent magnet, so keep it away from any storage media such as floppy disks and magnetic cards.
- The Optical Engine is very sensitive to vibration and shocks, so handle it with care.
- Do not disassemble any components (such as the power supply unit) which do not have express disassembly procedures described in this Service Manual.

4.1.3 Safety precautions

For safety purpose, and to protect the product from damage, the precautions given below must always be observed.

1. Disconnect the power cable from both the projector and the electrical outlet.
2. Disconnect any interface cables from the projector.
3. Always wear gloves when disassembling and reassembling the projector.
4. Use static discharge equipment such as anti-static wrist straps when accessing internal components to protect sensitive electronic components and circuitry.
5. Remove any metallic objects such as wristwatches, shirt cuff buttons, rings and tie pins which may pose a danger of coming into contact with the projector.
6. Before disassembling the projector, make sure to clean any dust or dirt on the air filter, interface section and outer case using a vacuum cleaner or other method.

4.1.4 Tools and Equipment

The table below lists the tools and equipment required for servicing the projector. All are commercially available, and should be made ready beforehand.

Table 4-1.

Name	Qty.	Application
Phillips screwdriver No. 0 (8cm)	1	Disassembling the focus ring and the zoom ring
Phillips screwdriver No. 1 (10cm)	1	Disassembling the outer case and inner components
Phillips screwdriver No. 2 (10cm)	1	Disassembling the outer case and inner components
Flathead screwdriver	1	Disassembling the rear foot and the front foot
Hexagonal box screwdriver (5 mm)	1	Removing the computer interface
Tweezers	1	Removing the FPC cable
Heat-resistant tape	q.s.*	Securing cables
Brush	1	Cleaning away dust
Vacuum cleaner	1	Cleaning away dust
Lens cleaner	q.s.*	Cleaning the projection lens
Air blower	1	Cleaning the light valves and fans
Gloves	1	
Anti-static wrist band	1	

* q.s.: sufficient quantity

4.1.5 Precautions for Optical Engine and Main (MA) Board

The Optical Engine and Main (MA) Board are paired together as a single service part. Neither is available separately. For service that requires the replacement of either the MA Board or the Optical Engine, both components must be replaced together.
The component parts of the Optical Engine require mechanical installation positions to be adjusted in relation to each other. In addition, the control circuit also has its own unique characteristics, such as display signal output drivers, that differ from projector to projector. There are also unique differences in each optical system mechanism, such as in the light valves.
In order to obtain the optimum display, it is necessary to eliminate these differences in electrical and mechanical characteristics as well as to make mechanical adjustments. The various correction values are set at the time of shipment from the factory and are stored in ROM on the MA Board.

CAUTION

- Always replace the Optical Engine and MA Board together as a matched pair.
- Do not disassemble the Optical Engine. Special jigs are required for reinstalling the optical components in the engine, such as POP Assy., condenser lens, mirrors. Reassembling the Optical Engine without using the jigs are strictly prohibited.
- Do not remove the upper guide cover of the Optical Engine. Doing so may contaminate the internal components with dust or dirt attached to the Optical Engine and adversely affect the image quality.

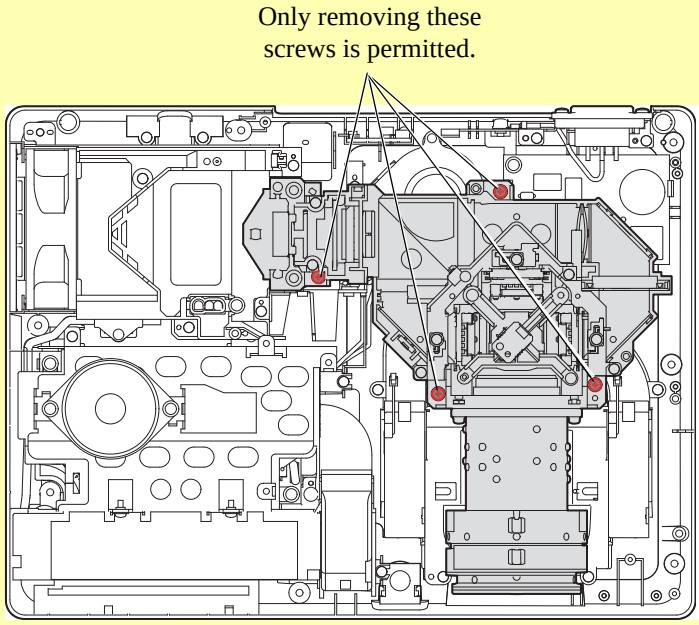


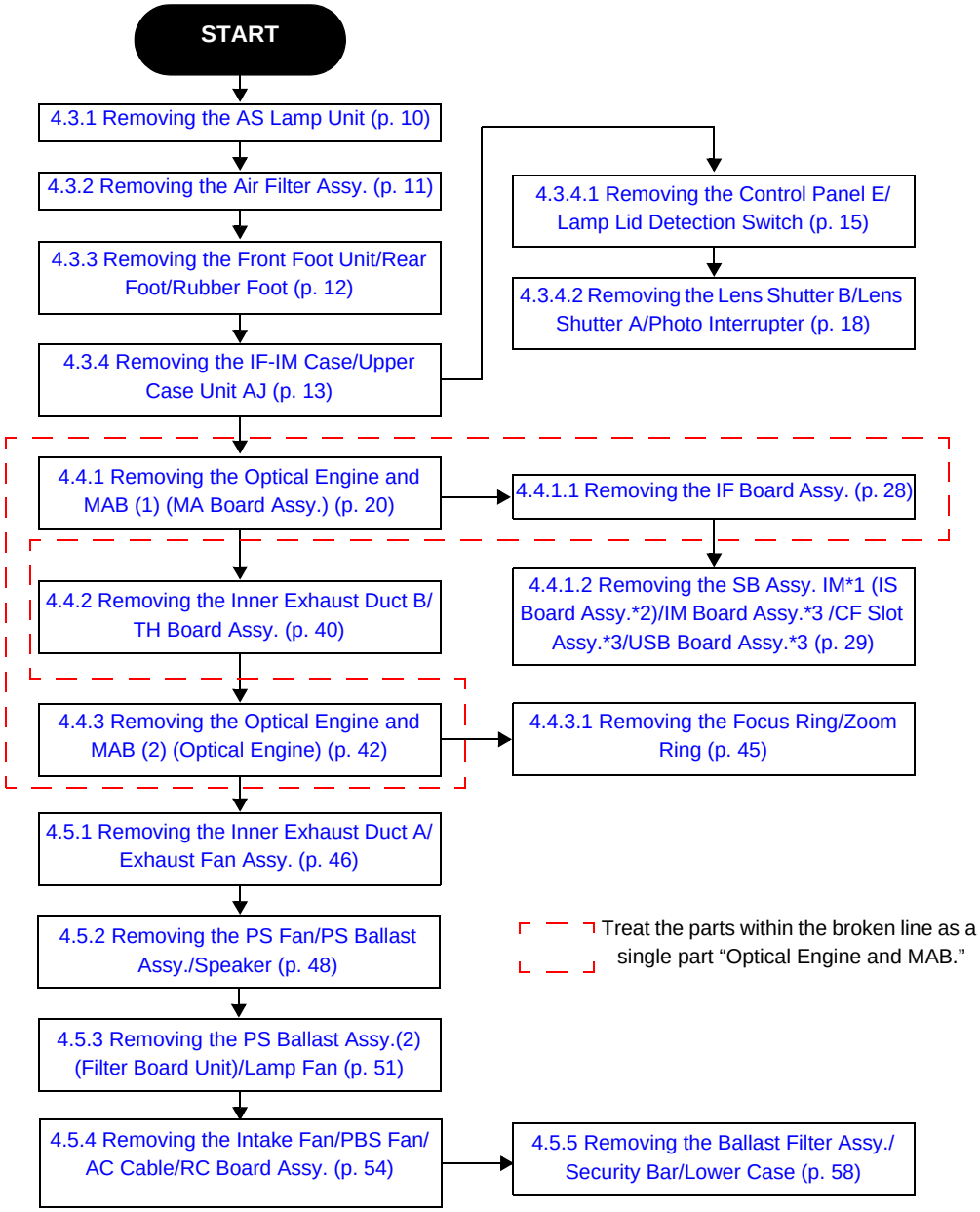
Figure 4-1.

4.2 Projector Disassembly and Assembly

The general disassembly procedure for the EMP-1825/1815/1810 projectors is illustrated below. Except where indicated separately, all reassembly should be carried out by following the disassembly procedures in reverse. Detailed disassembly procedures for each component are given in Sections 4.3 "Removing Exterior Parts/Components" to 4.5 "Removing Other Main Parts", links to which are given in the flowchart below.

CAUTION

Do not reassemble the Optical Engine.


START
4.3.1 Removing the AS Lamp Unit (p. 10)
4.3.2 Removing the Air Filter Assy. (p. 11)
4.3.3 Removing the Front Foot Unit/Rear Foot/Rubber Foot (p. 12)
4.3.4 Removing the IF-IM Case/Upper Case Unit AJ (p. 13)
4.3.4.1 Removing the Control Panel E/ Lamp Lid Detection Switch (p. 15)
4.3.4.2 Removing the Lens Shutter B/Lens Shutter A/Photo Interrupter (p. 18)
4.4.1 Removing the Optical Engine and MAB (1) (MA Board Assy.) (p. 20)
4.4.1.1 Removing the IF Board Assy. (p. 28)
4.4.1.2 Removing the SB Assy. IM*1 (IS Board Assy.*2)/IM Board Assy.*3 /CF Slot Assy.*3/USB Board Assy.*3 (p. 29)
4.4.2 Removing the Inner Exhaust Duct B/ TH Board Assy. (p. 40)
4.4.3 Removing the Optical Engine and MAB (2) (Optical Engine) (p. 42)
4.4.3.1 Removing the Focus Ring/Zoom Ring (p. 45)
4.5.1 Removing the Inner Exhaust Duct A/ Exhaust Fan Assy. (p. 46)
4.5.2 Removing the PS Fan/PS Ballast Assy./Speaker (p. 48)
4.5.3 Removing the PS Ballast Assy.(2) (Filter Board Unit)/Lamp Fan (p. 51)
4.5.4 Removing the Intake Fan/PBS Fan/ AC Cable/RC Board Assy. (p. 54)
4.5.5 Removing the Ballast Filter Assy./ Security Bar/Lower Case (p. 58)
Treat the parts within the broken line as a single part “Optical Engine and MAB.”

CHECK POINT

- The procedures are described with EMP-1815 otherwise specified.
- The part names above and in this chapter are simplified. See the “Part Names given in the SPI” table on the next page for the corresponding official names.

Figure 4-2.

The table below shows the part names used in this chapter and their official names given in the After Service Part List in the SPI (Service Part Information).

Table 4-2. Part Names given in the SPI

Official Name used in SPI	Names used this Chapter
Optical Engine and MAB	Optical Engine
LAMP UNIT FOR AS	AS Lamp Unit
CASE,LOWER	Lower Case
filter,ballast	Ballast Filter
AIR FILTER ASSY.	Air Filter Assy.
FILTER,RC	RC Filter
CABLE RCR;FIF	Cable RCR FIF
FOOT,REAR	Rear Foot
FOOT RUBBER	Rubber Foot
FOOT UNIT,FRONT	Front Foot Unit
HOLDER,PS	PS Holder
FAN ASSY,EXHAUST	Exhaust Fan Assy.
SHEET,FAN PROTECTION;FIF	Fan Protection Sheet FIF
CUSHION,INTAKE FAN;A	Intake Fan Cushion A
PRINTED CIRCUID BOARD ASSEMBLY;RC	RC Board Assy.
DUCT,INTAKE	Intake Duct
FAN,INTAKE;A	Intake Fan A
FAN,INTAKE;B	Intake Fan B
SHEET,INTAKE FAN	Intake Fan Sheet
PLATE NUT;M2	M2 Plate Nut
DUCT,PS	PS Duct
FAN,PS	PS Fan
POWER SUPPLY BALLAST ASSY	PS Ballast Assy.
FAN,LAMP	Lamp Fan
SHIELD PLATE,LAMP	Lamp Shield Plate
DUCT,LAMP	Lamp Duct
Sheet_BS,FIF	BS Sheet FIF
DUCT,EXHAUST,INNER;A	Inner Exhaust Duct A
DUCT,EXHAUST,INNER;B	Inner Exhaust Duct B
PRINTED CIRCUIT BOARD ASSEMBLY;TH_R1	TH Board Assy.
CABLE TH;FIF	TH Cable FIF
FOCUS RING	Focus Ring
ZOOM RING	Zoom Ring
CASE,IF,IM	IF-IM Case
PLATE,IF,IM	IF-IM Plate
SPEAKER	Speaker

Table 4-2. Part Names given in the SPI

Official Name used in SPI	Names used this Chapter
SWITCH,LAMP LID DETECT	Lamp Lid Detection Switch
PLATE,USB FASTEN	USB Fastening Plate
PRINTED CIRCUIT BOARD ASSEMBLY;US	USB Board Assy.
SHEET,IF,SHADE	IF Shade Sheet
EMI,SUPPRESSOR	EMI Suppressor Sheet
SHIELD,PLATE,IM	IM;2 Shield Plate
CASE,UPPER,ASSY;AJ	Upper Case Assy. AJ
CASE UNIT,UPPER;AJ	Upper Case Unit AJ
SHEET,CASE UPPER	Upper Case Sheet
CUSHION,COVER PRJ LENS;B	PJ Lens Cushion B
SHEET,SHADE;IM	Shade Sheet IM
LENS,LED	LED Lens
PLATE,NUT;M3	M3 Plate Nut
PHOTO INTERRUPTER	Photo Interrupter
CABLE,SW	SW Cable
SHUTTER,LENS;A	Lens Shutter A
SHEET,SHUTTER LENS	Lens Shutter Sheet
SHUTTER,LENS;B	Lens Shutter B
SPRING,SHUTTER	Shutter Spring
LID,LAMP,AS	AS Lamp Lid
S.C.B.SCREW,3X6,F/NI	←
LID,CASE UPPER	Upper Case Lid
CUSHION;LED	Cushion LED
SHEET,USB,SHADE	USB Shade Sheet
SHEET,SHADE;L	Shade Sheet L
GASKET;B	Gasket B
CONTROL PANEL;E	Control Panel E
Model Name Plate	Model Name Plate
DUMMY CARD,CF	Dummy CF Card
SLOT,CF, ASSY.	CF Slot Assy.
LABEL,IF	IF Label
SHEET,SENSOR	Sensor Sheet
PRINTED CIRCUIT BOARD ASSEMBLY;IM_S2	IM Board Assy.
PRINTED CIRCUIT BOARD ASSEMBLY;IF_S2	IF Board Assy.
PRINTED CIRCUIT BOARD ASSEMBLY;IS_S2	SB Board Assy. IM
PRINTED CIRCUIT BOARD ASSEMBLY;IS_S2	IS Board Assy.
PRINTED CIRCUIT BOARD ASSEMBLY;USB_S2	USB Board Assy.
FFC,SENSERBOARD,IM	SB-IM FFC Cable

Table 4-2. Part Names given in the SPI

Official Name used in SPI	Names used this Chapter
CABLE,MA-IM	MA-IM Cable
CABLE,USB	USB Cable
PLATE,CF	CF Plate
PLATE,IM,FASTEN	IM Fastening Plate
SHEET,SHADE,CFSLOT	CF Slot Shading Sheet
SHEET.SHADE,USB	USB Shading Sheet
COVER,DUCT,EX,INNER;B	Cover Inner EX Duct B
SHEET,SHADE;LG	LG Shading Sheet
FILTER BOARD UNIT	Filter Board Unit
PLATE,ACINLET,FASTEN	AC Inlet Fastening Plate
DUCT,PBS	PBS Duct
EMI,SUPPRESSOR;E	EMI Suppressor E

4.3 Removing Exterior Parts/Components

4.3.1 Removing the AS Lamp Unit

1. Loosen the screw (SCREW,LAMP;3X6) that secures the AS Lamp Lid, and remove the AS Lamp Lid.
2. Remove the screw (SCREW,LAMP;3X6) from the AS Lamp Lid.
3. Loosen the two screws that secure the AS Lamp Unit and remove the AS Lamp Unit.

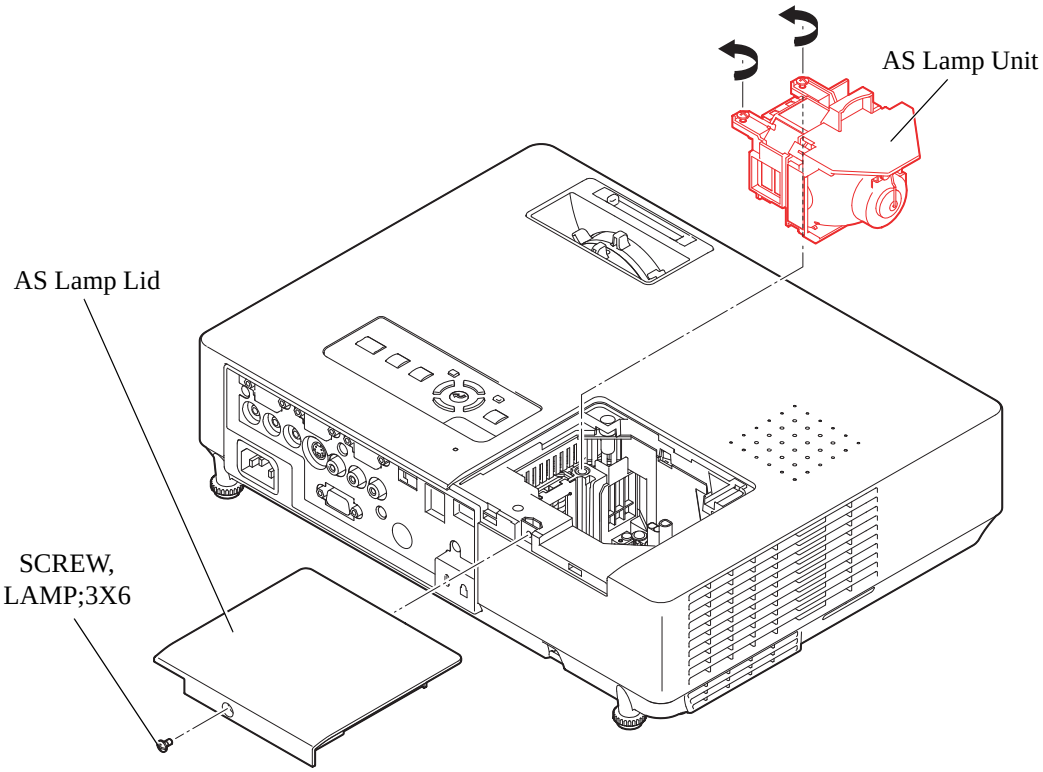


Figure 4-3.

4. (EMP-1825/1815 only)
   Push the button on the right of the CF Card Slot, and remove the Dummy CF Card.
5. (EMP-1825/1815 only)
   If the Wireless LAN Unit is mounted, remove the screw that secures the Wireless LAN Unit and remove the Wireless LAN Unit.

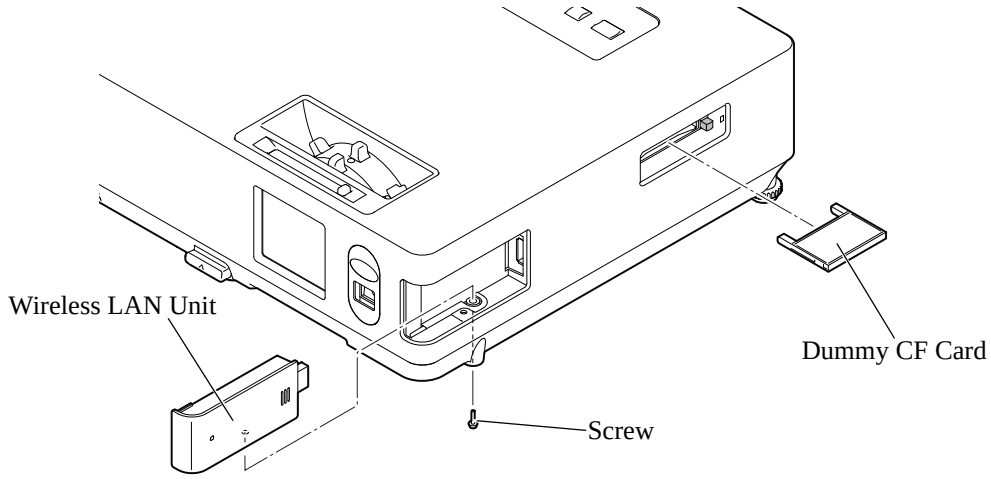


Figure 4-4.

4.3.2 Removing the Air Filter Assy.

1. Pull the tab of the Air Filter Assy. in the direction of the arrow with your finger, and remove the Air Filter Frame.

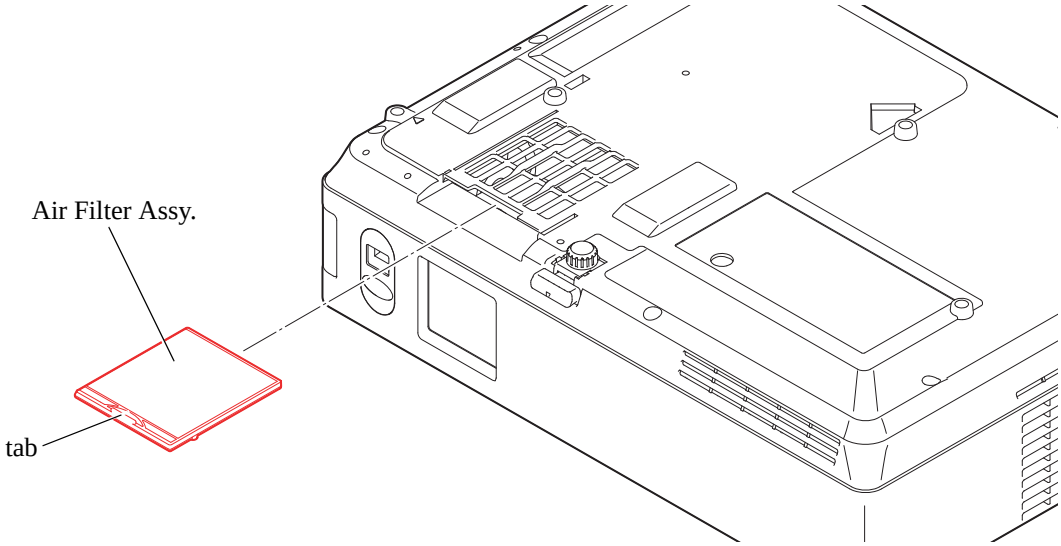


Figure 4-5.

4.3.3 Removing the Front Foot Unit/Rear Foot/Rubber Foot

■ Removing the Front Foot Unit

1). Press a screwdriver or similar tool into the small slot beside the Front Foot Unit, and take out the Front Foot Unit.

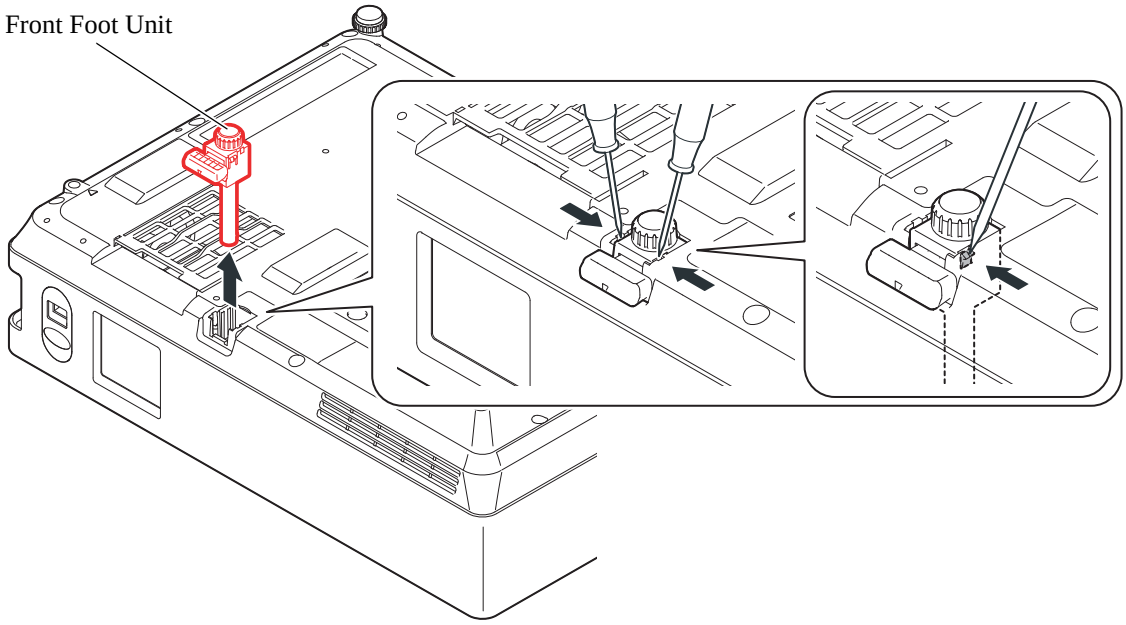


Figure 4-6.

■ Removing the Rear Foot/Rubber Foot

1). Pull and rotate the Rear Foot to remove the Rear Foot.

2). Press a screwdriver or similar tool into the small slot beside the Rear Foot and pry out the Rubber Foot from the projector Lower Case Unit.

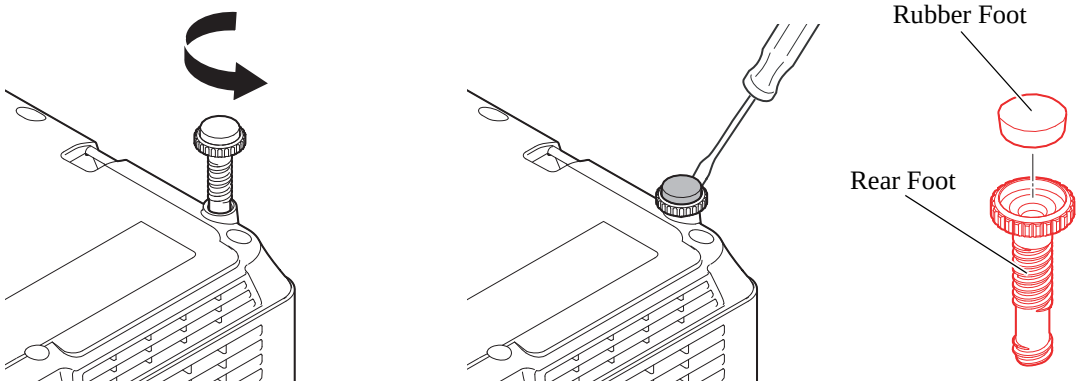


Figure 4-7.

4.3.4 Removing the IF-IM Case/Upper Case Unit AJ

■ Removing the IF-IM Case

1). Remove the four screws (C.B.SCREW,3X6,F/NI) that secure the IF-IM Case, and remove the IF-IM Case.

2). Remove the IF Label from the IF-IM Case.

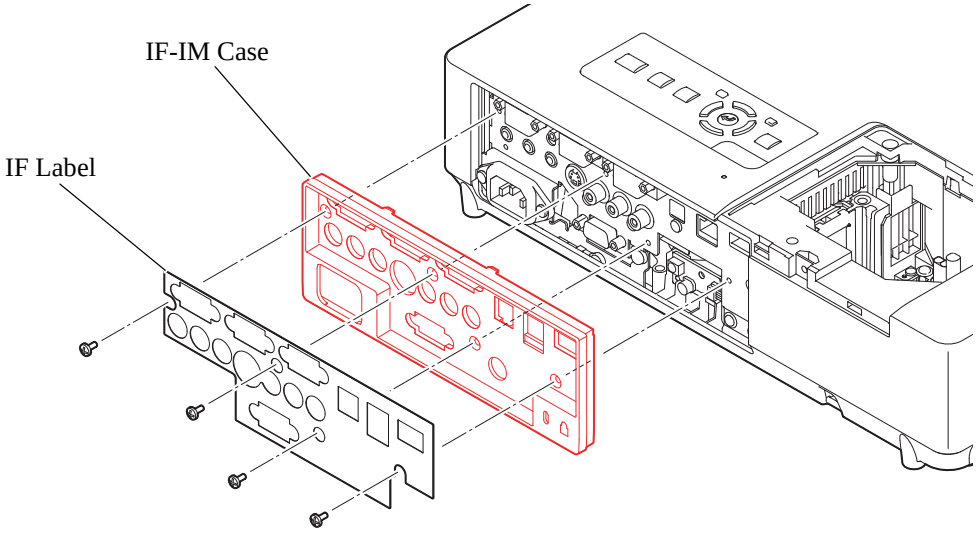


Figure 4-8.

■ Removing the Upper Case Unit AJ

3). Remove the eight screws (C.B.P-TITE SCREW,3X10,F/ZB-3C) that secure the Upper Case Unit AJ from the bottom.

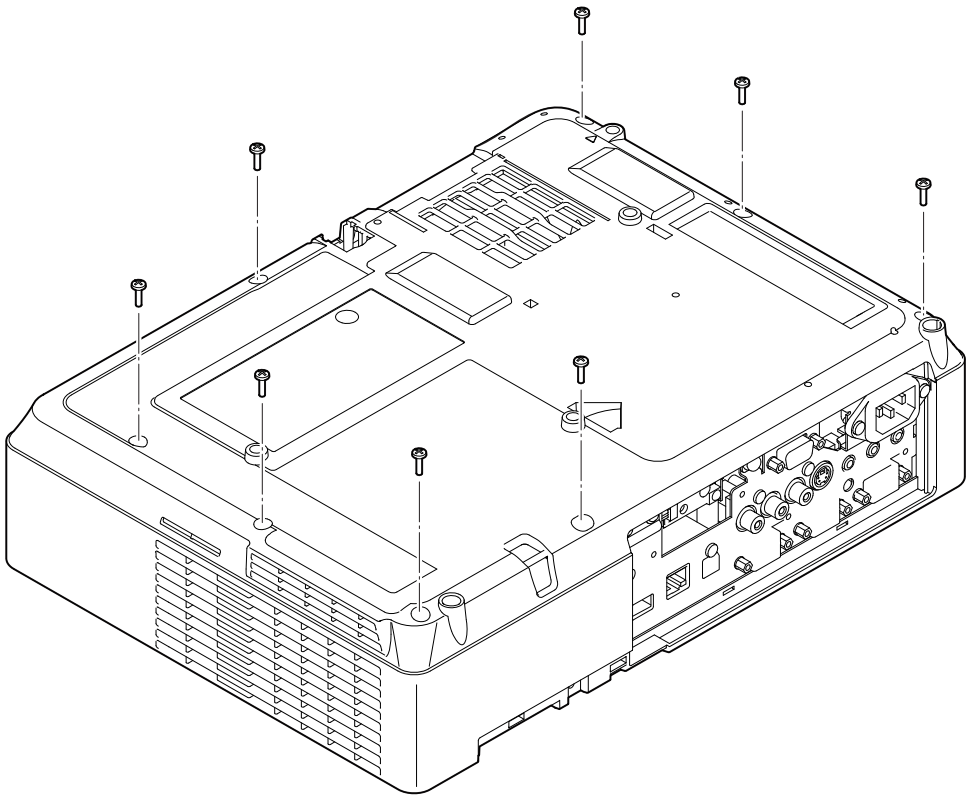


Figure 4-9.

4). Remove the screw (C.B.P-TITE SCREW,3X10,F/ZB-3C) that secures the Upper Case Unit AJ from the top.

5). Remove the M3 Plate Nut from the Upper Case Unit.

6). Lift the Upper Case Unit carefully. (Three cables are connected to the MA Board. So, be careful not to lift the case too much to avoid the damage to the three connector cables.)

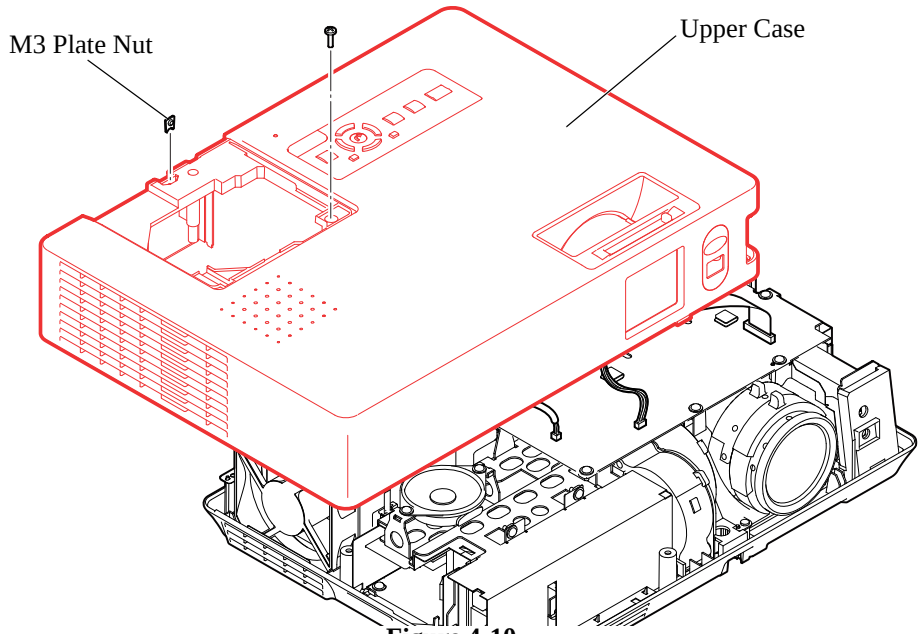


Figure 4-10.

CAUTION

When connecting the cable to CN1203, be sure to lock the connector.

7). Disconnect the two connector cables from the connectors CN1201 and CN1204 on the MA Board, and unlock the connector CN1203 and disconnect the Control Panel Cable.

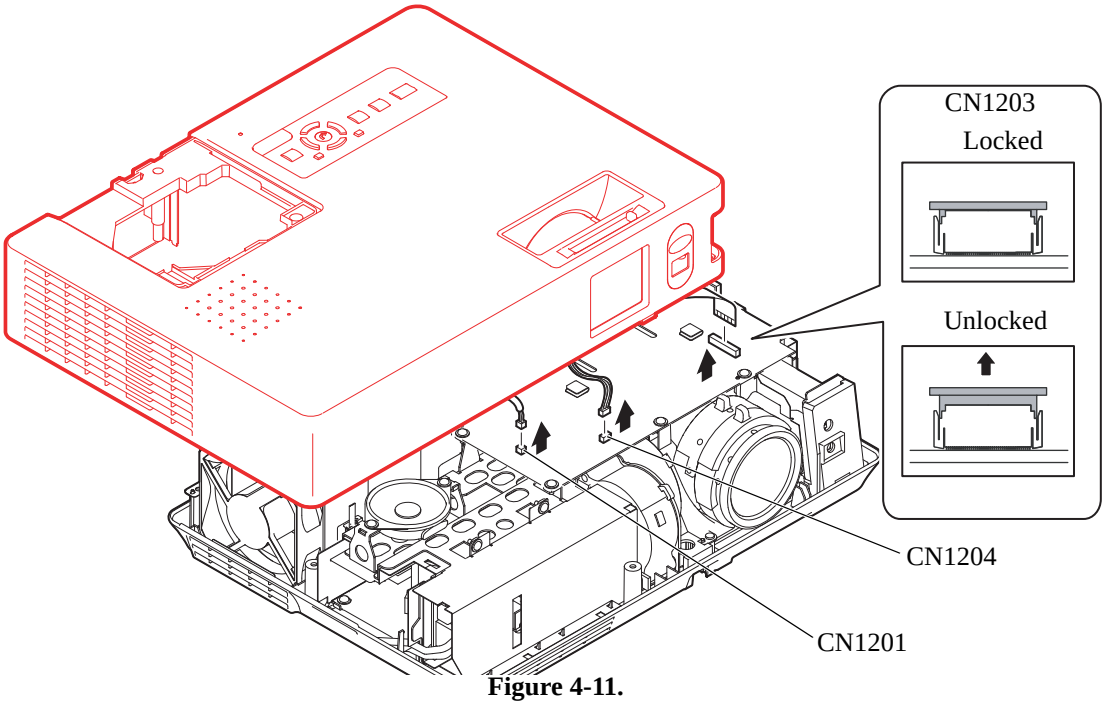


Figure 4-11.

4.3.4.1. Removing the Control Panel E/Lamp Lid Detection Switch

1. Remove the Control Panel E from the Upper Case Unit AJ.
2. Remove the screw (C.C.B-TITE SCREW,2X12,F/ZN-3C) that secures the Lamp Lid Detection Switch, and remove the Lamp Lid Detection Switch from the Upper Case Unit AJ.
3. Remove the following parts from the Upper Case Unit AJ.
   - Upper Case Sheet
   - PJ Lens Cushion B
   - Sensor Sheet
   - LG Shading Sheet
   - Ferrite Core
   - LED Lens (* EMP-1825/1815 only)
   - LED Cushion (* EMP-1825/1815 only)

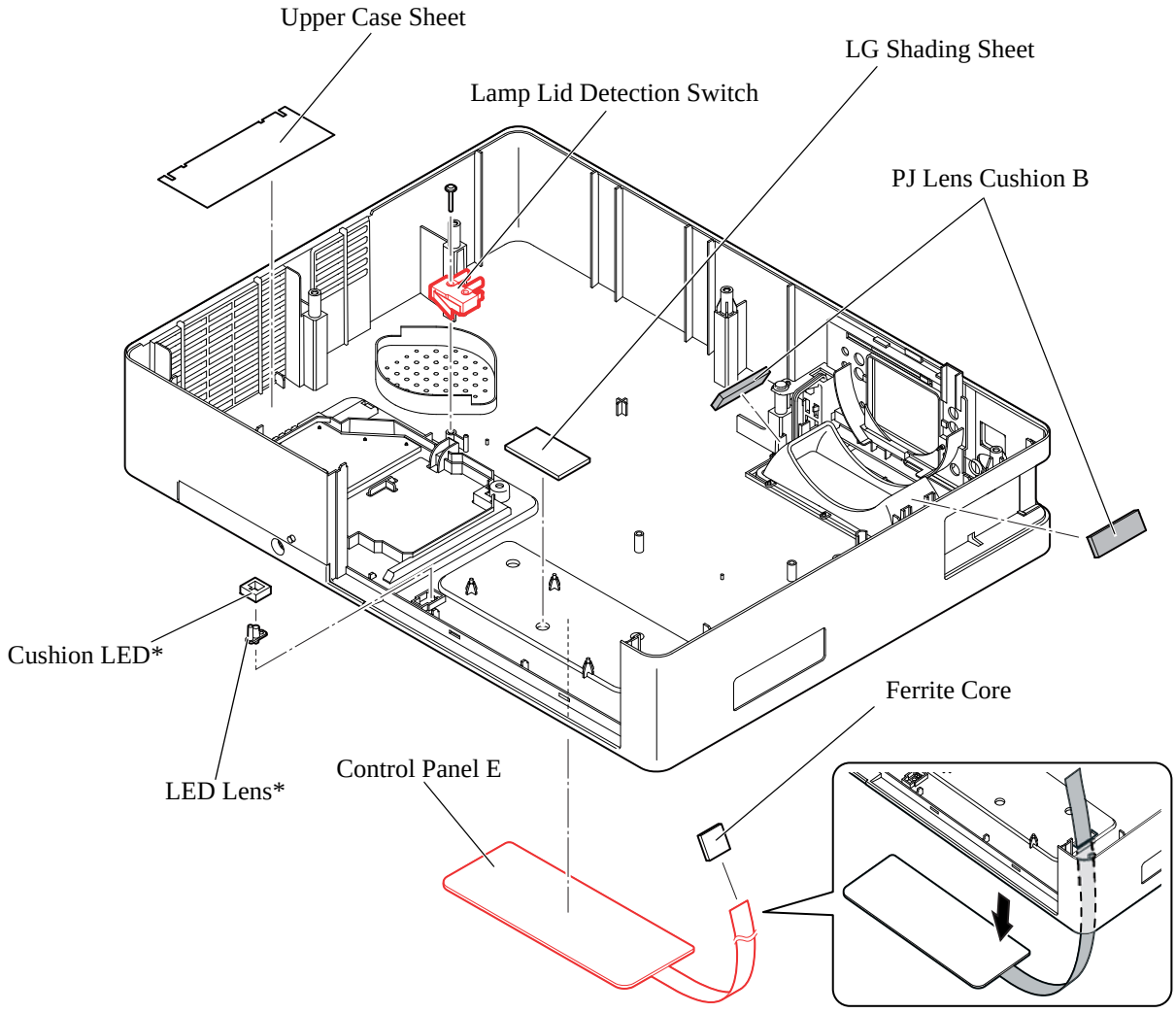


Figure 4-12.

CAUTION

■ When reassembling the Upper Case, attach the parts below to the specified places according to the standard.

- PJ Lens Cushion B

  Horizontally: the center between the red lines.
  Vertically: aligning it to the guide.
- Upper Case Sheet

  Attach the sheet matching it to the Upper Case's rib's shape.
- L/G Shade Sheet;A

  Horizontally: align it to the rib (red-lined)
  Vertically: align it to the edge of the hollow for Control Panel (blue-lined).

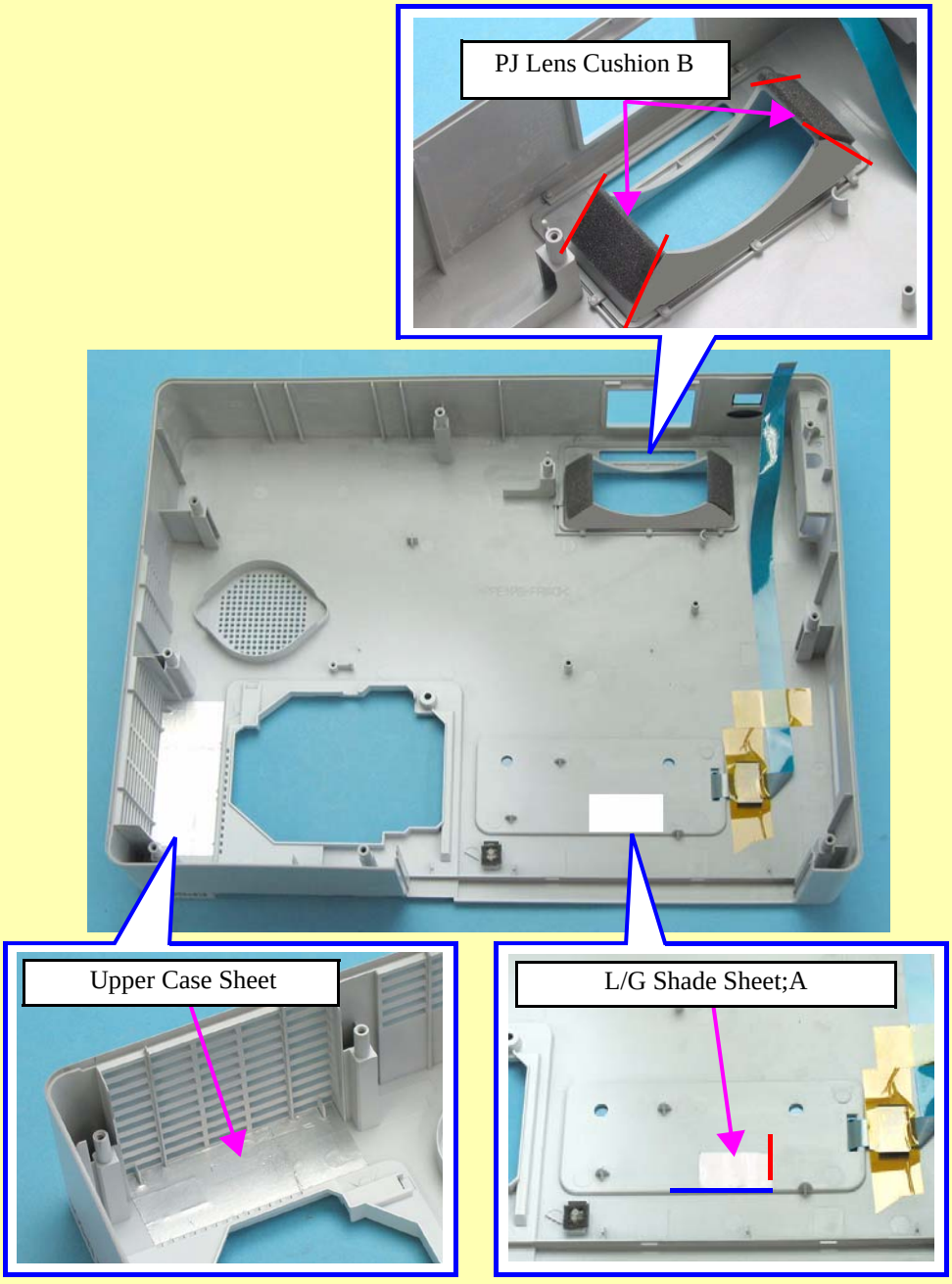


Figure 4-13.

CAUTION

■ Secure the SW cable and the ferrite core of the Control Panel to the Upper Case with heat-resistant tape according to the standard below.

- Red lines: 4.5cm ± 5mm in between.
- Blue lines: attach the ferrite core in the center between the lines.
- Green lines: the same length as the Control Panel.

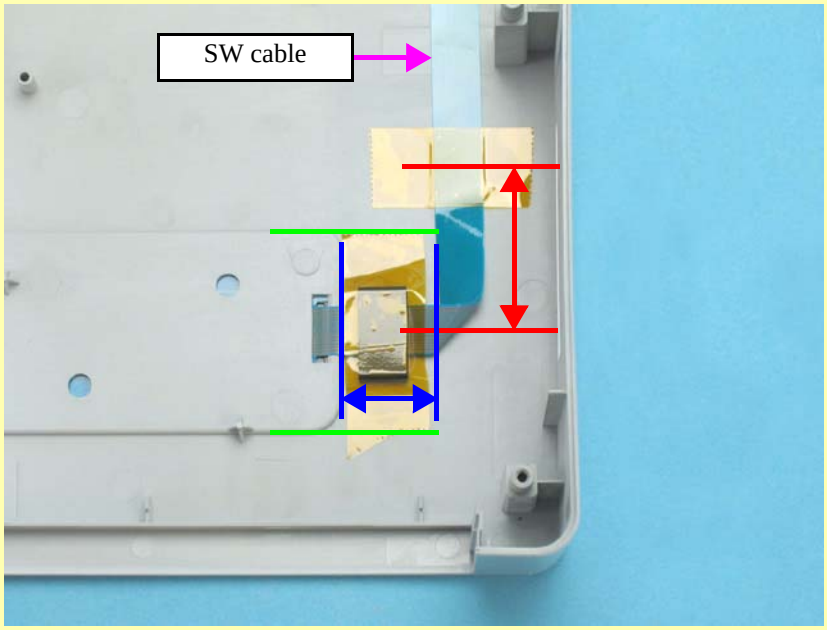


Figure 4-14.

- Fold the SW Cable outward at 90 degrees between the Wireless LAN socket and the rib shown in (1), then fold back the cable inward at 180 degrees aligning it with its right edge as shown in (2).
- Secure the fold with heat resistant tape as shown in (3).

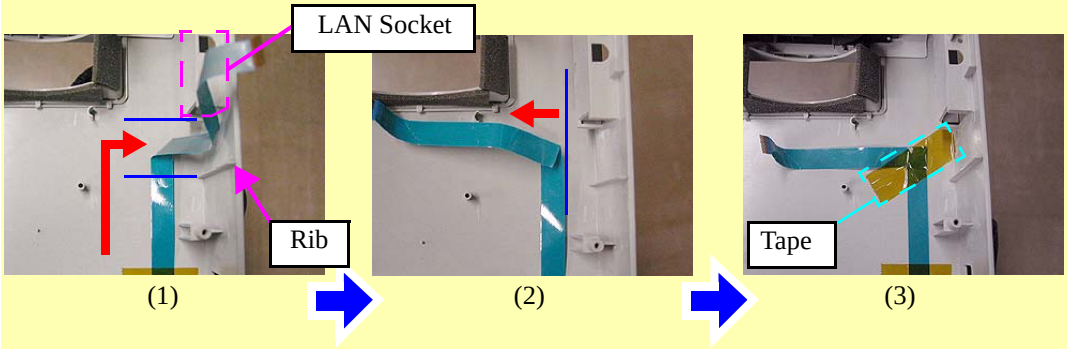


Figure 4-15.

- No caught cables, or floating case is allowed.
- Connect the following connectors.

Connector No.	Connected to
CN1201	Lamp Lid Detection SW
CN1203	Control Panel
CN1204	Photo Interrupter

4.3.4.2. Removing the Lens Shutter B/Lens Shutter A/Photo Interrupter

1. Remove the screw (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secures the Lens Shutter B, and remove the Lens Shutter B from the Upper Case Unit AJ together with the Lens Shutter A and the Photo Interrupter.
2. Remove the Lens Shutter A and the Shutter Spring from the Lens Shutter B.
3. Remove the Photo Interrupter from the Lens Shutter B
4. Remove the SW Cable from the Photo Interrupter.
5. Remove the Lens Shutter Sheet from the Lens Shutter A.

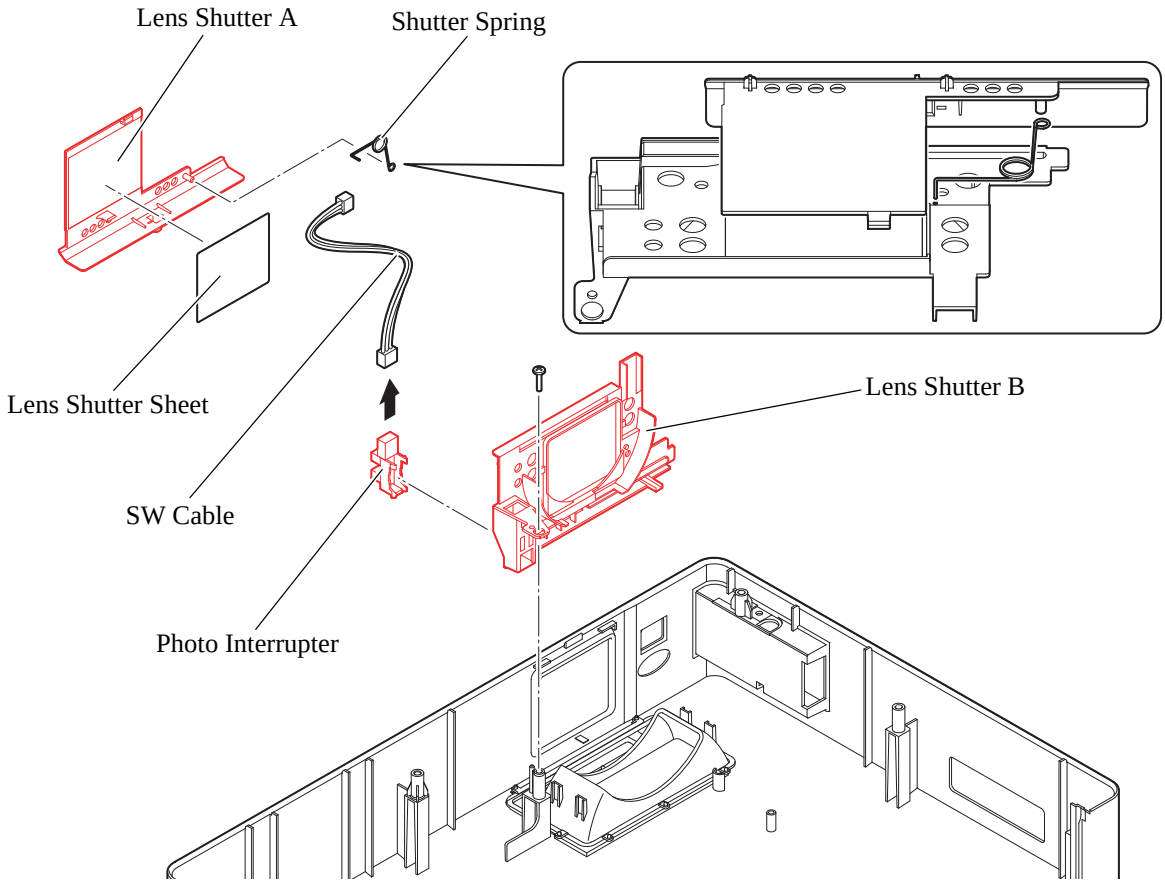


Figure 4-16.

CAUTION

■ When attaching the Lens Shutter Sheet to the Lens Shutter, follow the standard below.

- Align the sheet to the red lines.
- Protrusion: 0mm (outside)/ within 1mm (inside)

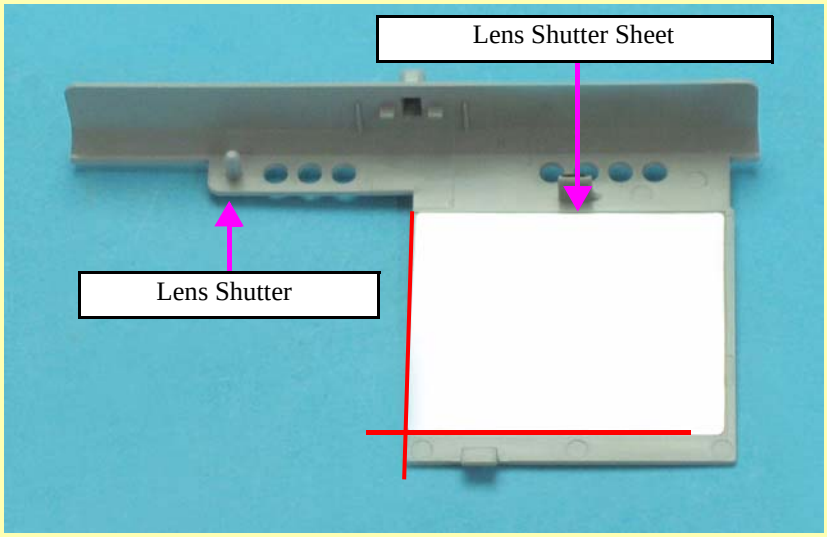


Figure 4-17.

■ After replacing the Photo Interrupter, always perform operation check as described below.

1). Turn the power on with the Lens Shutter open.

2). After confirming that the blue image (default) is displayed, close the Lens Shutter as shown below. If the image turns black, there is no problem with the parts or the connection.

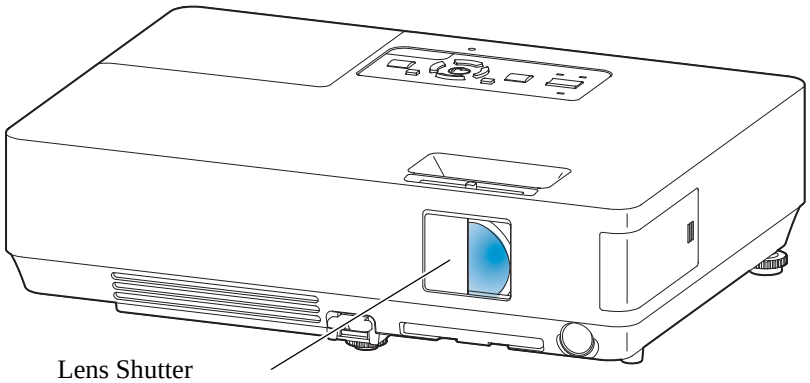


Figure 4-18.

4.4 Removing the Engine/Boards

4.4.1 Removing the Optical Engine and MAB (1) (MA Board Assy.)

1. Unlock the connectors of the Light Valve R/G/B connection cables.

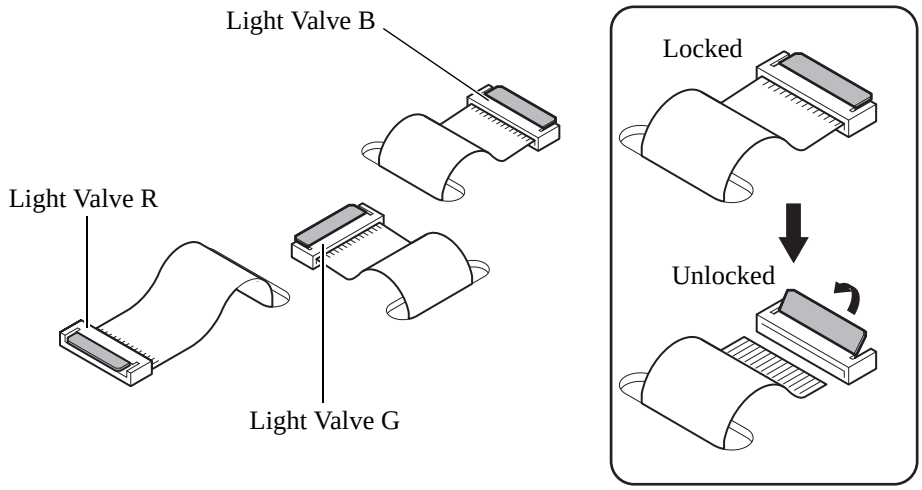


Figure 4-19.

CAUTION

- When connecting the R/G/B Light Valve cables, be sure to insert the R/G/B Light Valve cables securely into the connectors to the end. If there is a loose connection (a half-way/slant connection), it may cause short-circuiting, or malfunction, and which may result in damage to or overheating of the ICs on the cables.
- Be sure to lock the connectors when reassembling.

2. Disconnect the R/G/B Light Valve cables and the 13 connector cables that are connected to the MA Board from the board.

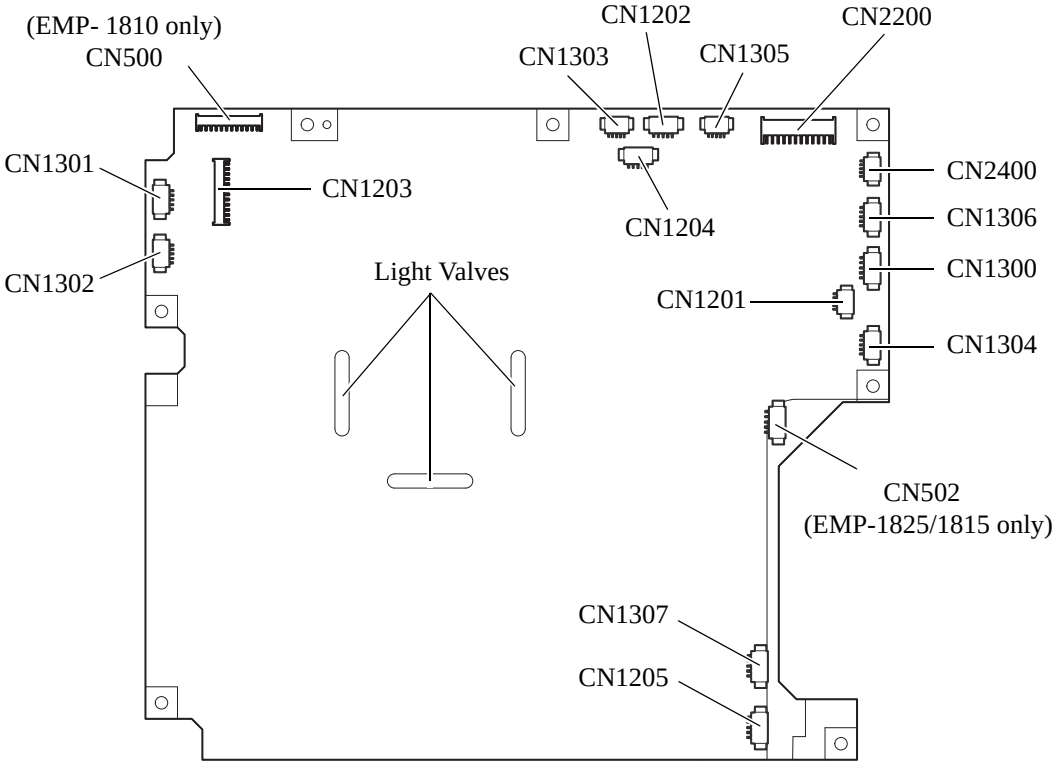


Figure 4-20.

3. Remove the nine screws (C.C.SCREW,3X6,F/ZN-3C) that secure the MA Board Assy.
4. Remove the screw (C.P.(S-P1)SCREW,4X6,F/ZN-3C) that secures the MA Board Assy.'s GND.
5. Remove the screw (C.B.SCREW,3X6,F/NI) that secures the USB terminal, and remove the MA Board Assy.
6. Remove the following parts from the MA Board Assy.
   - EMI Suppressor; C
   - Heat Sink;A x 3
   - Heat Sink;PW
   - PJ Lens Cover Cushion x2

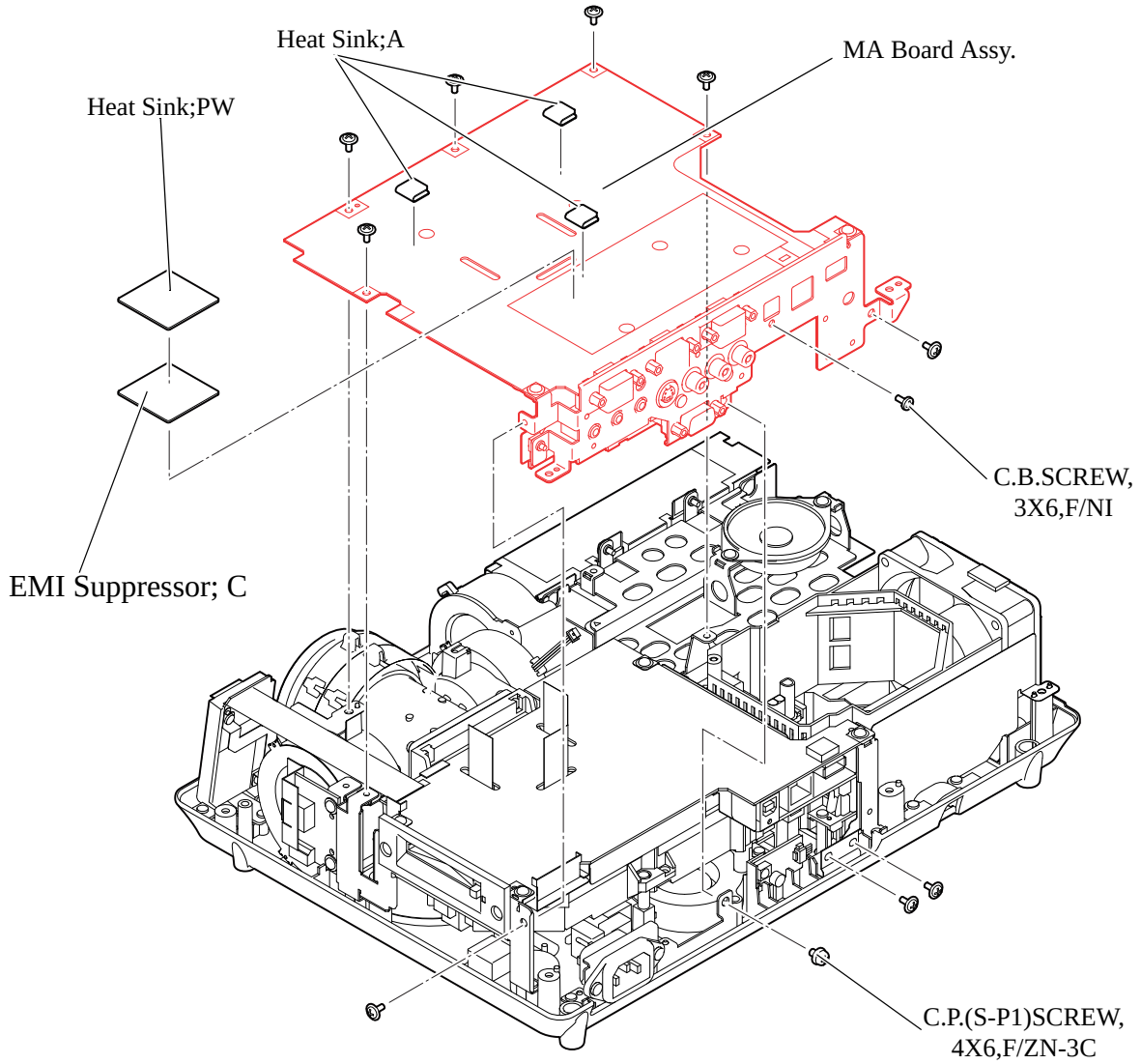


Figure 4-21.

CAUTION

■ When reassembling the MA board, attach the following parts as shown below.

1). Attach the EMI suppressor; C first, then attach the Heat Sink; PW on it.

2). Align the Heat Sink; A as shown in the figure below.

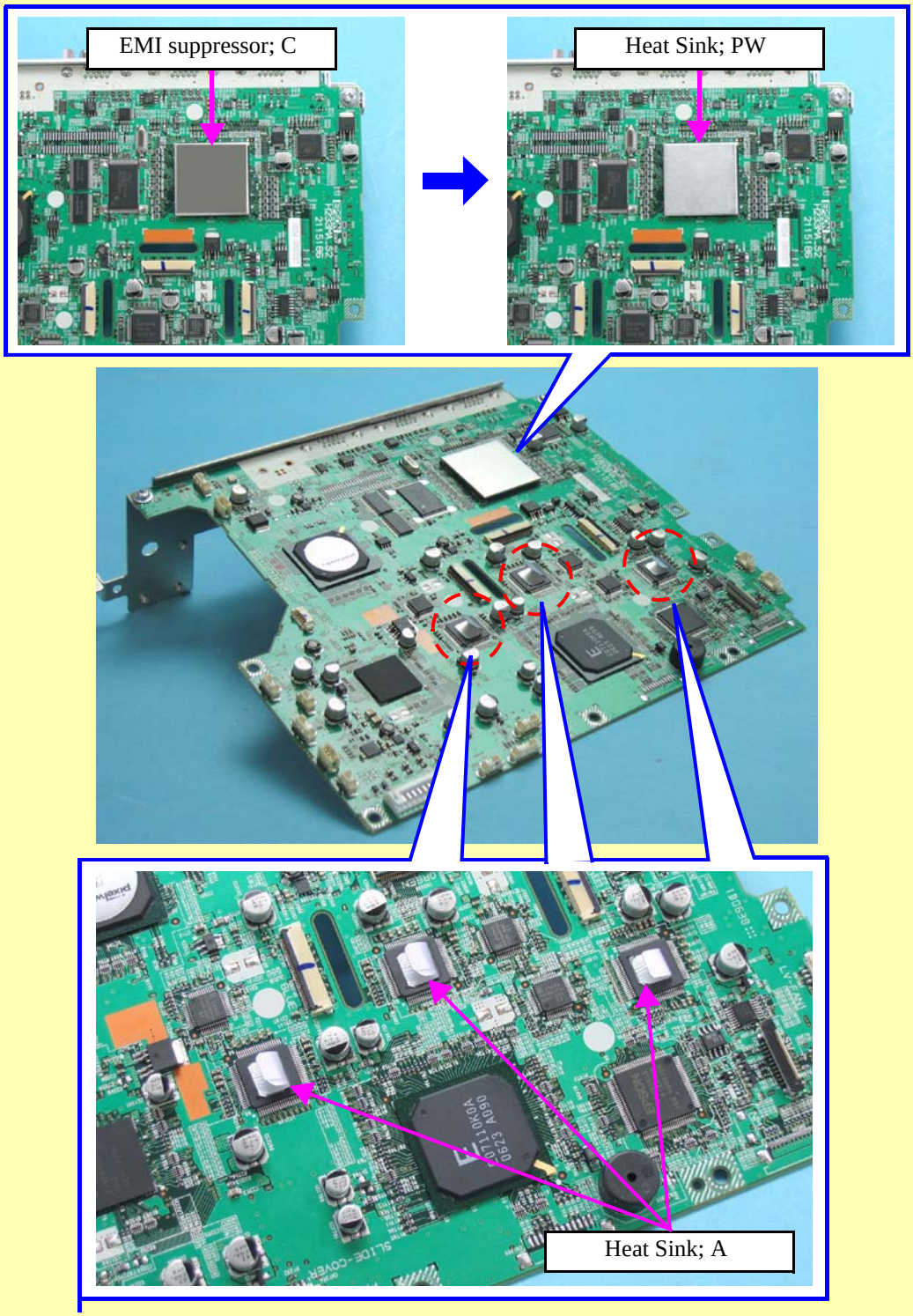


Figure 4-22.

CAUTION

■ Attach the IF Shade Sheet as shown in the figure below.

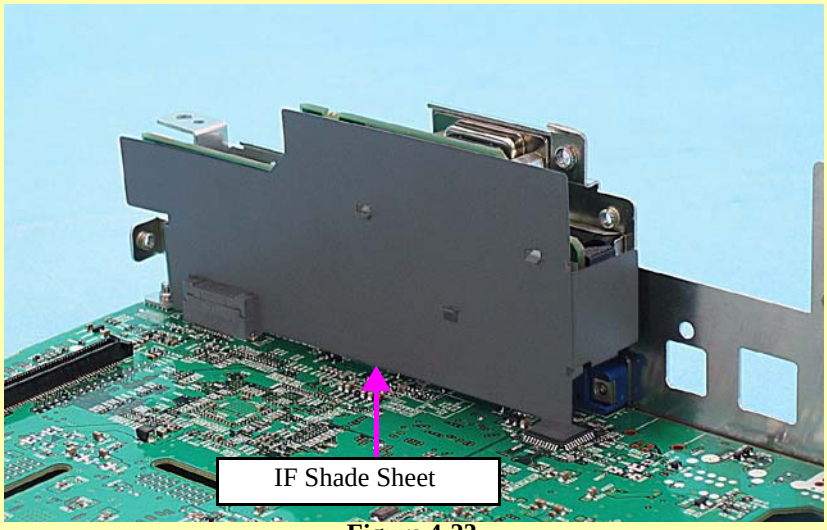


Figure 4-23.

■ **<EMP-1810 only>**

Attach the LAN Shade Sheet to the USB Terminal as shown in the figure below.

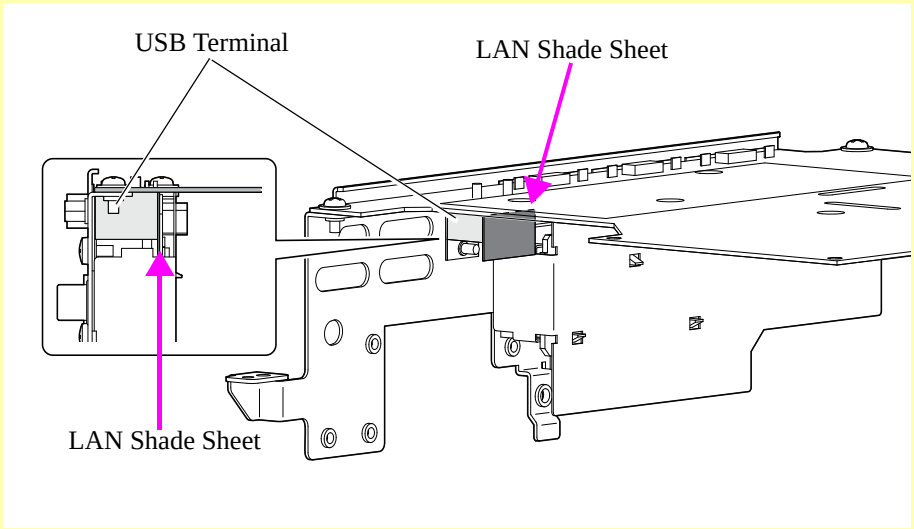


Figure 4-24.

CAUTION

■ When installing the MA Board Assy., be sure to place the red-circled parts coming inside of the metal parts as shown in the figures below.

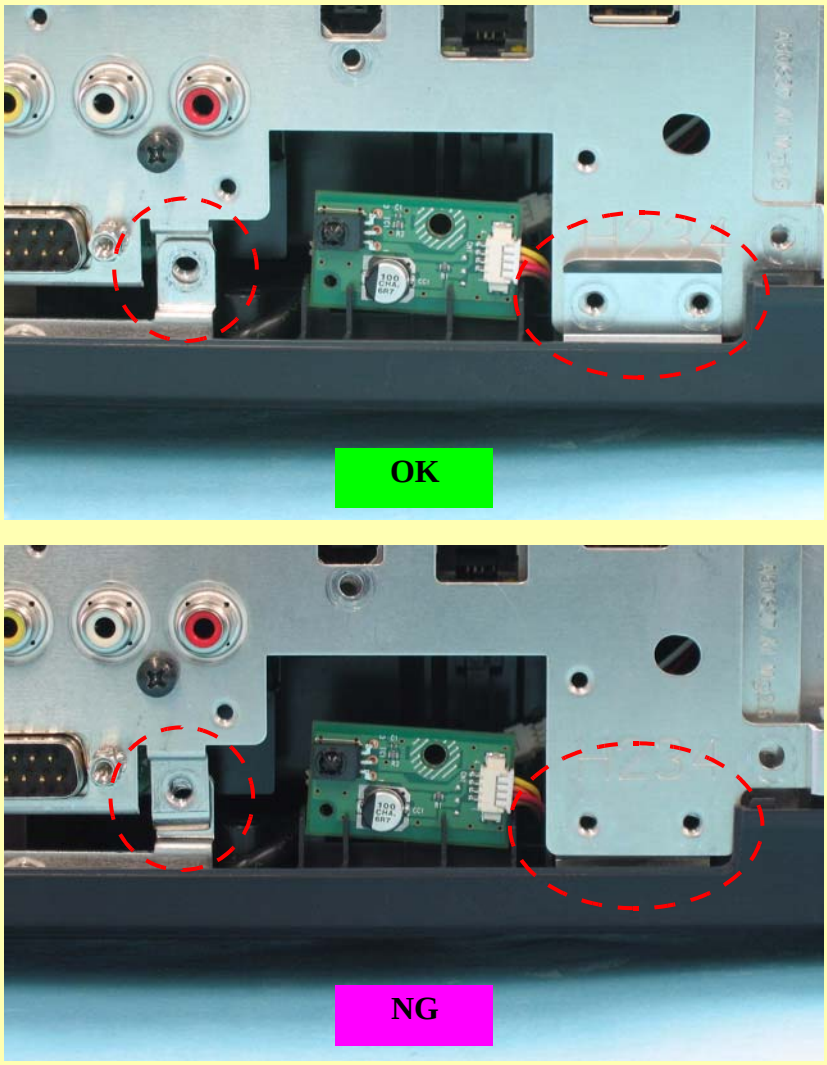


Figure 4-25.

CAUTION

■ When connecting the cables to the MA Board Assy., route the cables as follows.

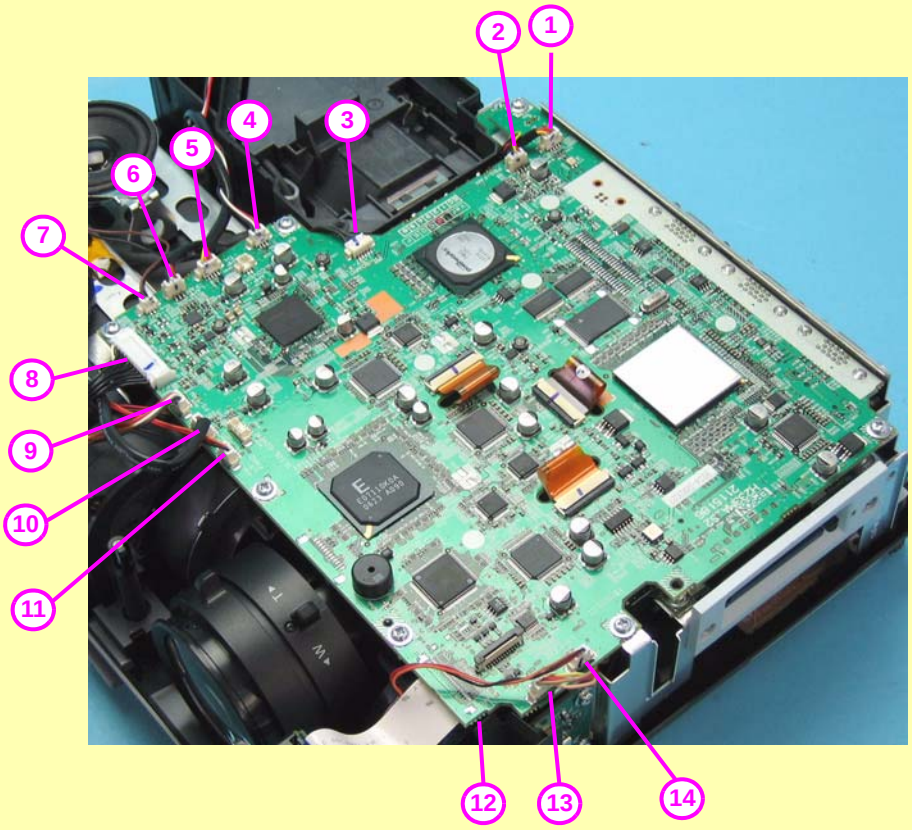


Figure 4-26.

No	Connected to	No	Connected to
1	RC Board	8	PS Ballast (PS)
2	PBS Fan	9	PS Fan
3	IM Board	10	PS Ballast (Ballast)
4	Exhaust Fan	11	Intake Fan (R)
5	TH board	12	IS Board
6	Lamp Fan	13	L/V thermistor
7	Speaker	14	Intake Fan (L)

CAUTION

- (1), (2), (3)'s Routing

1). Do not route the cables inside the red-line.

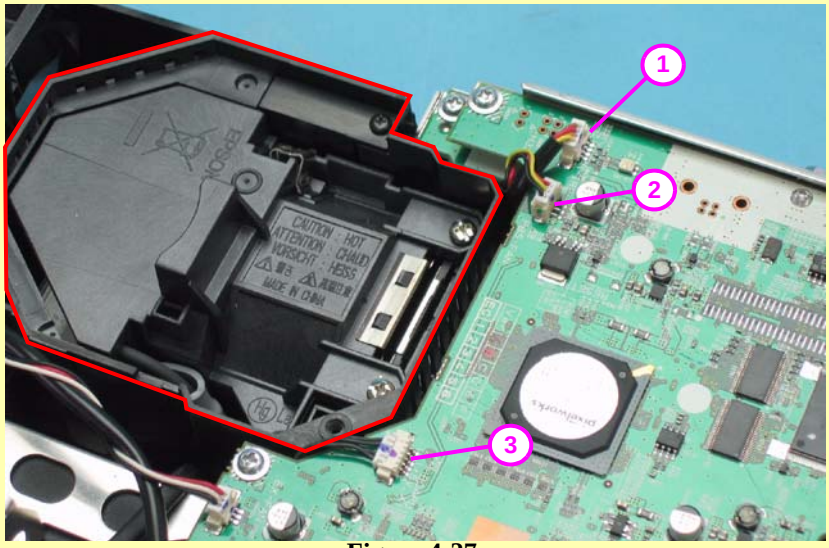


Figure 4-27.

- (4), (5), (6), (7), (8)'s Routing

1). Do not route the cables inside the red-line.

2). Twist (4) around (5) clockwise before connecting it.

3). Secure (8) tightly to the PS's frame with heat-resistant tape at the green square.

4). Do not route the cables over the blue-lined part.

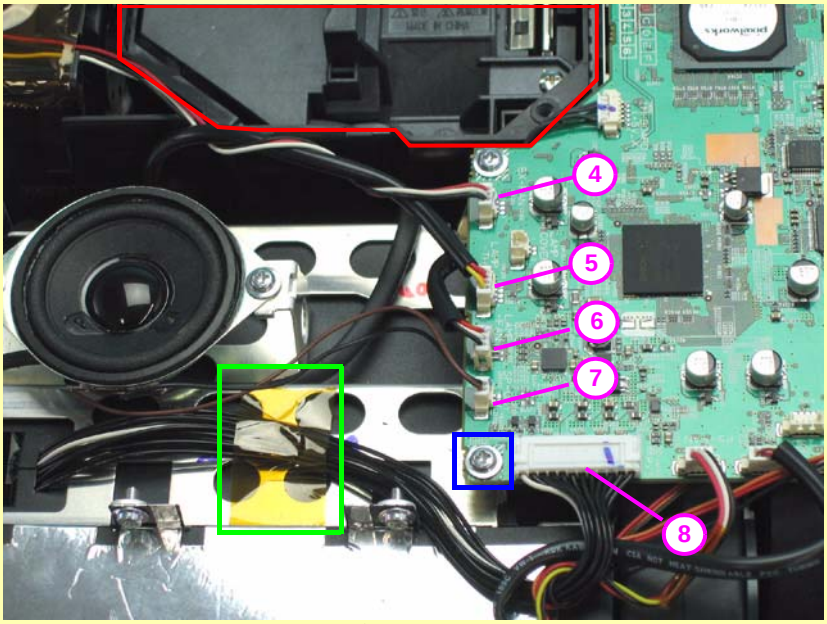


Figure 4-28.

CAUTION

- (8), (9), (10), (11)'s Routing

1). Route (8) through the loops of (9), (10), (11) before connecting it.

2). Do not route the cables outside the red line.

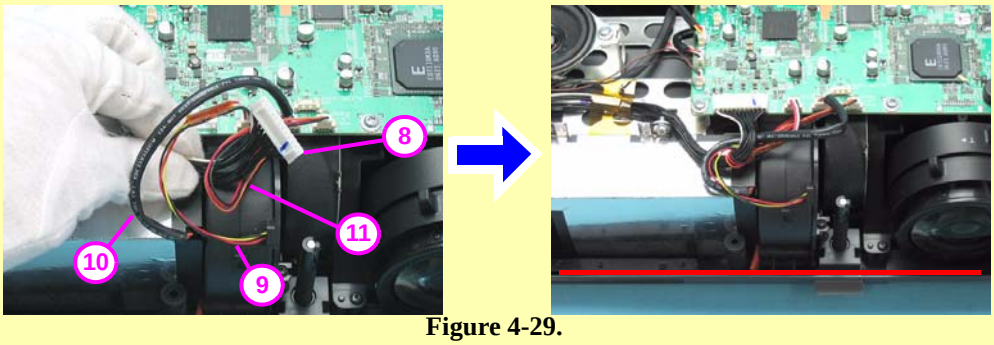


Figure 4-29.

- (12), (13), (14)'s Routing

1). Press down the top of (12)'s loop in the direction of the arrow to avoid the interference with the Lens Shutter.

2). Do not route (13) outside the red line.

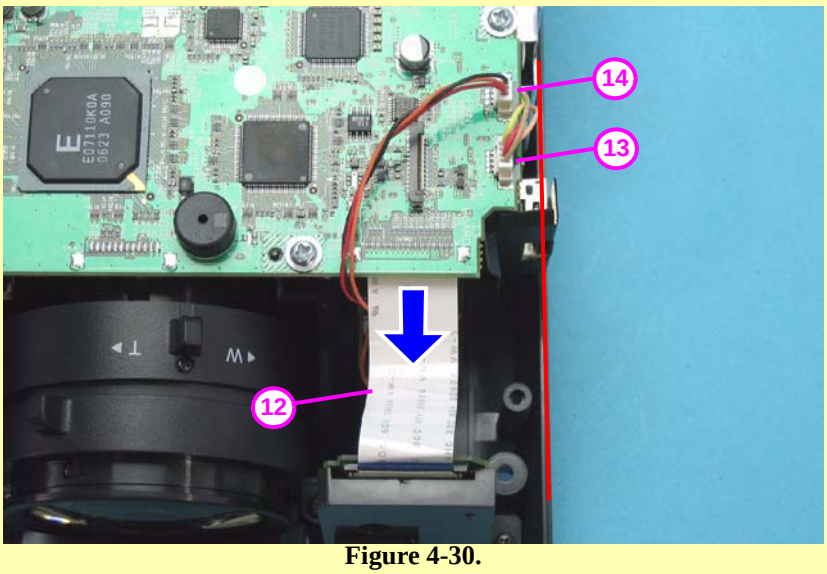


Figure 4-30.

4.4.1.1. Removing the IF Board Assy.

1. Remove the IF Shade Sheet from the MA Board Assy.
2. Remove the eight screws (Screw, HSH 4-40) that secure the D Sub15pin terminals and the two screws (C.B.P-TITE SCREW,3X8,F/ZB-3C) that secure the RCA terminals and S-terminal.
3. Remove the screw (C.C.SCREW,3X6,F/ZN-3C) that secures the IF Board Assy.
4. Remove the two screws (C.C.SCREW,3X6,F/ZN-3C) that secure the IF-IM Plate, and remove the IF-IM Plate together with the IF Board Assy. from the MA Board Assy.

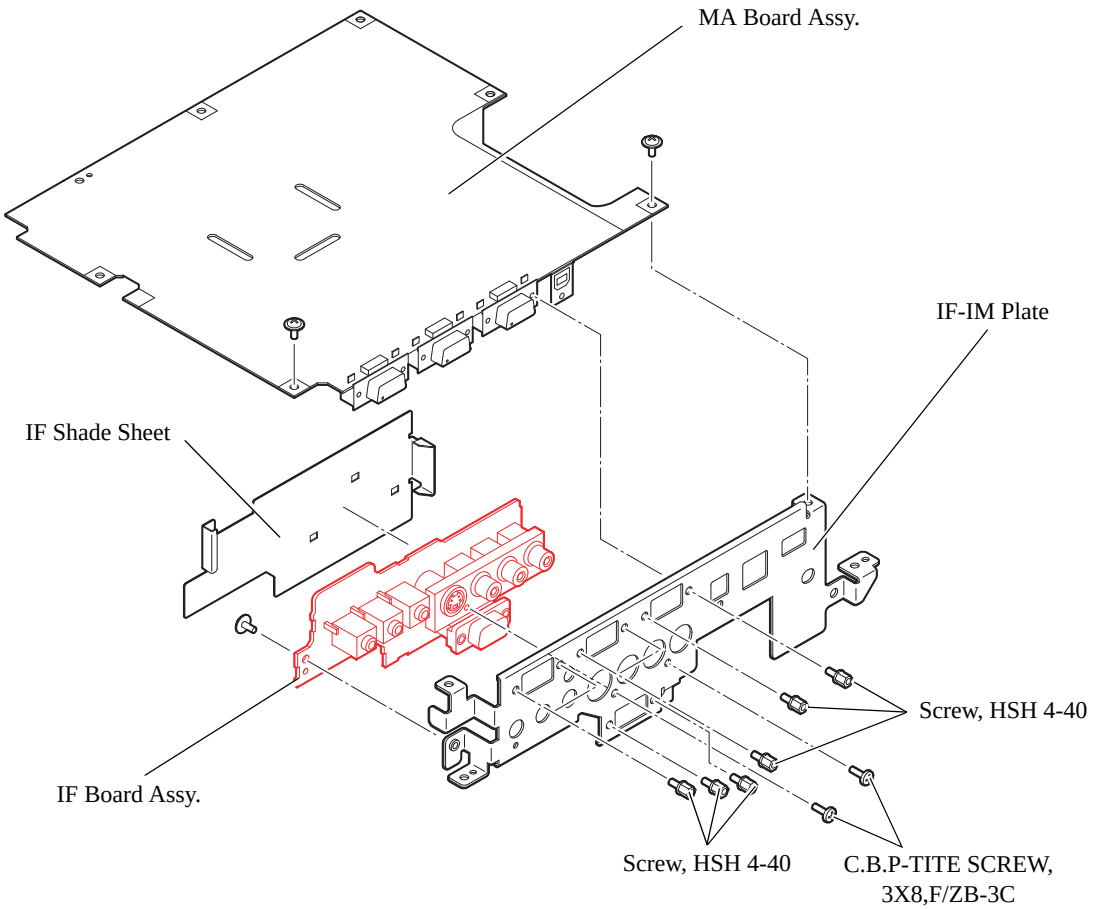


Figure 4-31.

4.4.1.2. Removing the SB Assy. IM*1 (IS Board Assy.*2)/IM Board Assy.*3 /CF Slot Assy.*3/USB Board Assy.*3

NOTE *1: EMP-1825/1815's Case/*2: EMP-1810's Case/*3: EMP-1825/1815 only

■ Removing SB Assy. IM (IS Board Assy.)

1). Disconnect the SB-IM FFC Cable from the connector on the SB Assy. IM (IS Board Assy.).

2). Remove the two screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the SB Fixing Plate, and remove the SB Fixing Plate together with the SB Assy. IM (IS Board Assy.) from the Lower Case.

3). Remove the two screws (C.B.P-TITE SCREW,2.5X6,F/ZN-3C) that secure SB Assy. IM (IS Board Assy.), and remove the SB Assy. IM (IS Board Assy.) from the SB Fixing Plate.

- Removing Conduction Plate; SB (EMP-1810 only)
  In Step 3, remove the Conduction Plate; SB at the same time.

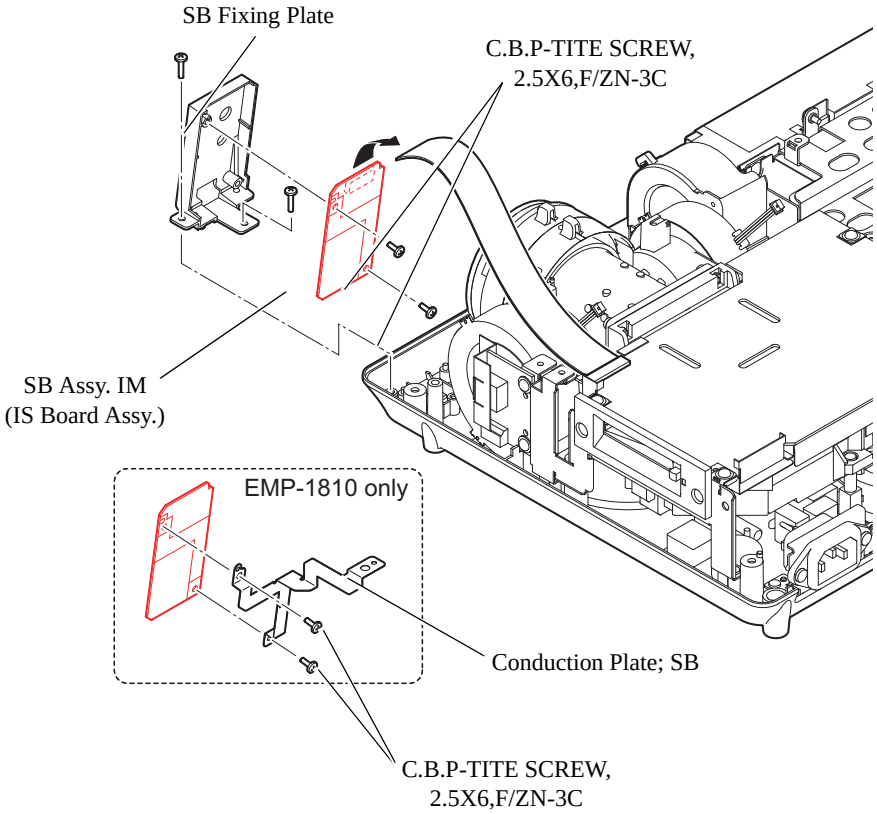


Figure 4-32.

■ Removing the IM Board Assy. (EMP-1825/1815 only)

4). Remove the screw (C.C.SCREW,3X6,F/ZN-3C) that secures the IM Board Assy.

5). Remove the three screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the IM Board Assy. and remove the IM Board Assy.

6). Disconnect the MA-IM Cable from the connector (CN1302) on the IM Board Assy.

7). Disconnect the SB-IM FFC Cable from the connector (CN1300) on the IM Board Assy.

8). Disconnect the USB Cable from the connector (CN30) on the USB Board Assy.

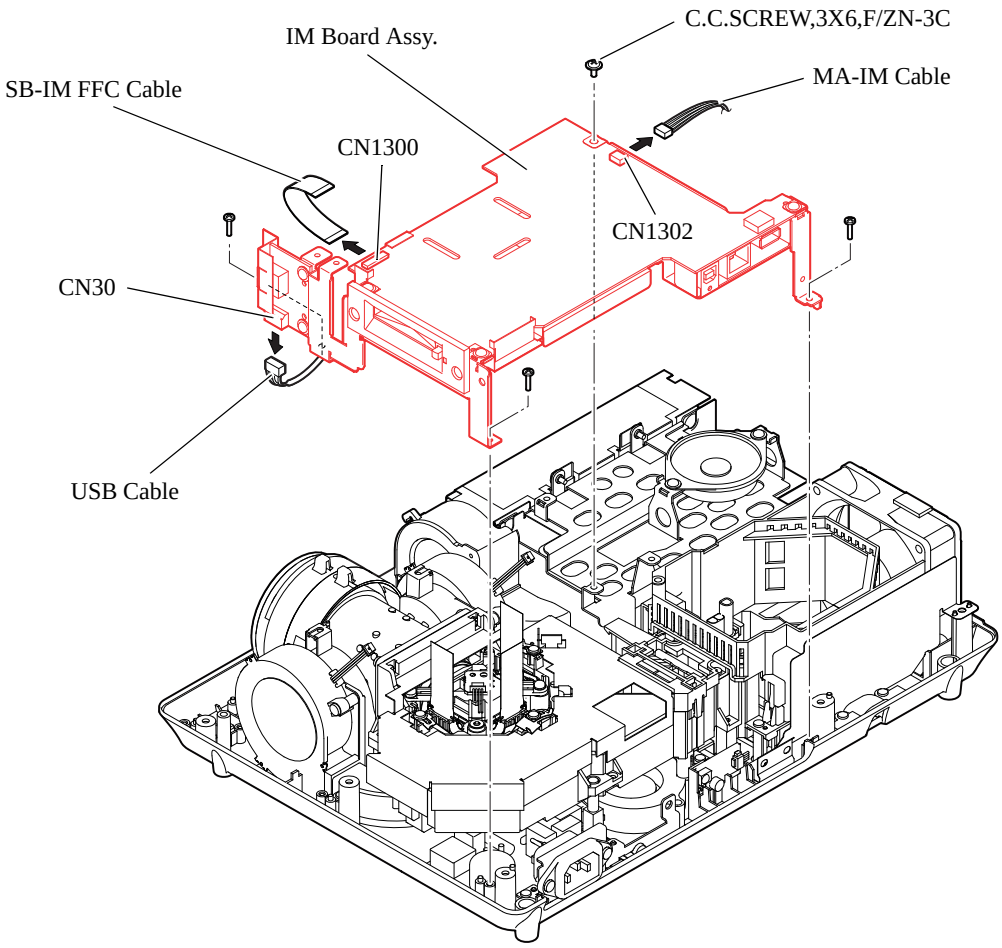


Figure 4-33.

9). Remove the two screws (C.C.SCREW,3X6,F/ZN-3C) that secure the CF Plate, and remove the CF Plate together with the USB Board Assy. and CF Slot Assy. (to Removing the USB Board Assy./CF Slot Assy. (EMP-1825/1815 only) (p. 38))

10). Remove the screw (C.C.SCREW,3X6,F/ZN-3C) that secures the IM Fastening Plate, and remove the IM Fastening Plate.

11). Remove the IM Shield Plate from the IM Board Assy.

12). Remove the USB Cable from the connector (CN801) on the IM Board Assy.

13). Remove the CF Slot Shading Sheet from the IM Board Assy.

14). Remove the Connector Shading Sheet from the IM Shied Plate.

15). Remove the following parts from the IM Board Assy.

- Gasket 5x5 x 3 (1)
- Gasket 10x10 x 2 (2)
- LAN Shading Sheet
- USB Shading Sheet;B
- EMI Suppressor* x 2 (EMP-1815's case)

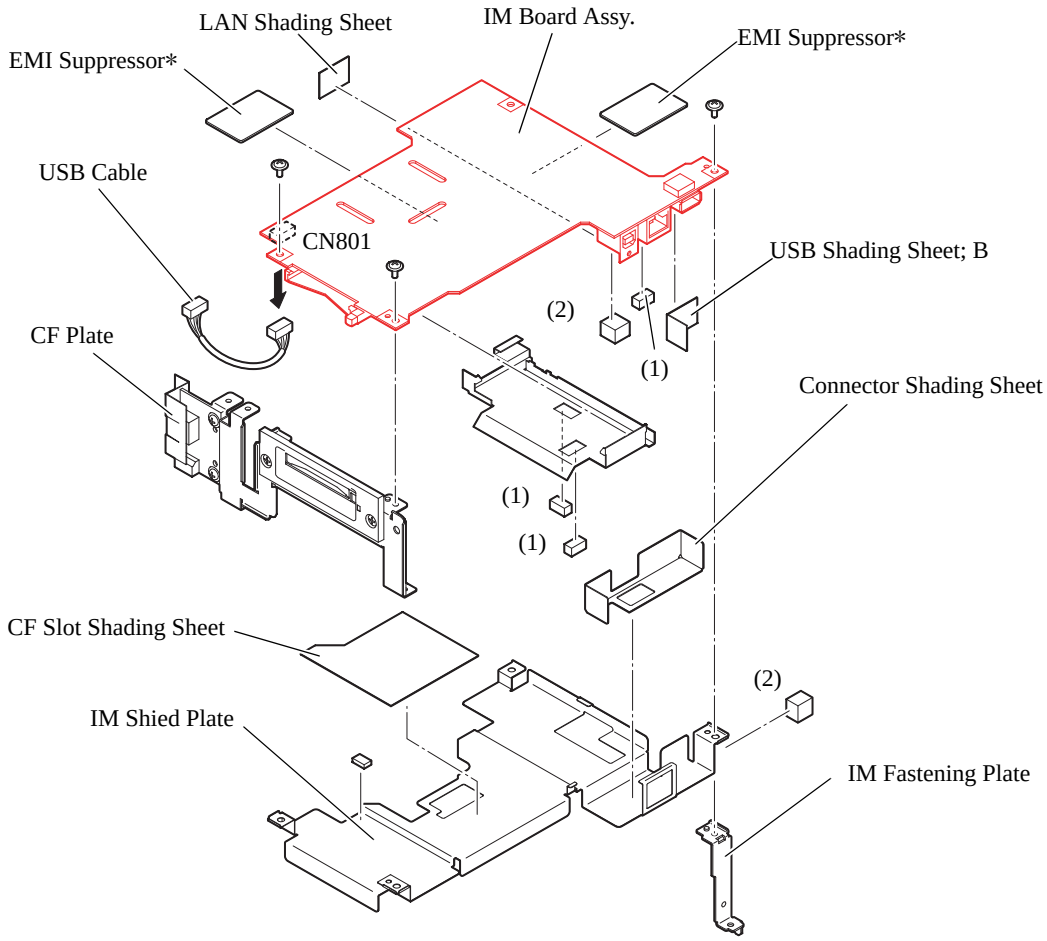


Figure 4-34.

■ Removing EMI Suppressor/EMI Suppressor E (EMP-1825's case)

CAUTION

- In EMP-1825's case, seven EMI Suppressor and two EMI Suppressor E are attached on the back of the IM Board Assy. Refer to Figure 4-37 (p. 33) for attaching locations.
- When replacing the IM Board Assy., refer to the instructions on the next page and attach EMI Suppressor and EMI Suppressor E to the specified locations.

16).Remove the seven EMI Suppressors from the back of the IM Board Assy.

17).Remove the two EMI Suppressor E in the same manner.

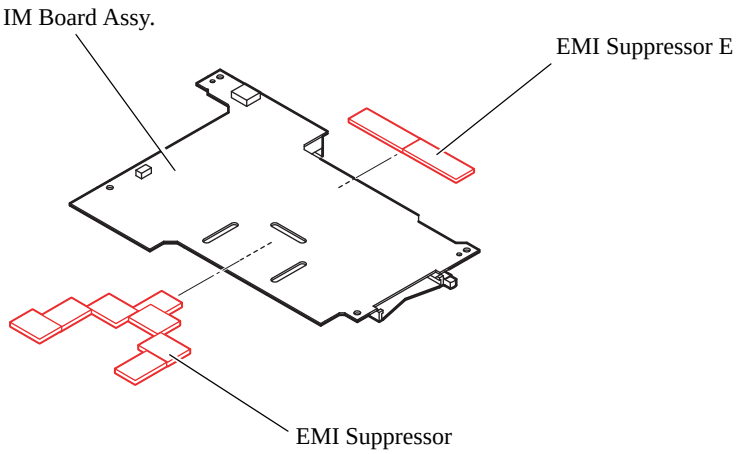


Figure 4-35.

■ Removing MA Shield Plate/Shield Plate Fasten (EMP-1810 only)

1). Remove the two screws (C.C.SCREW,3X6,F/ZN-3C) that secure the Shield Plate Fasten, and remove the Shield Plate Fasten.

2). Remove the screw (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secures the MA Shield Plate, and remove the MA Shield Plate.

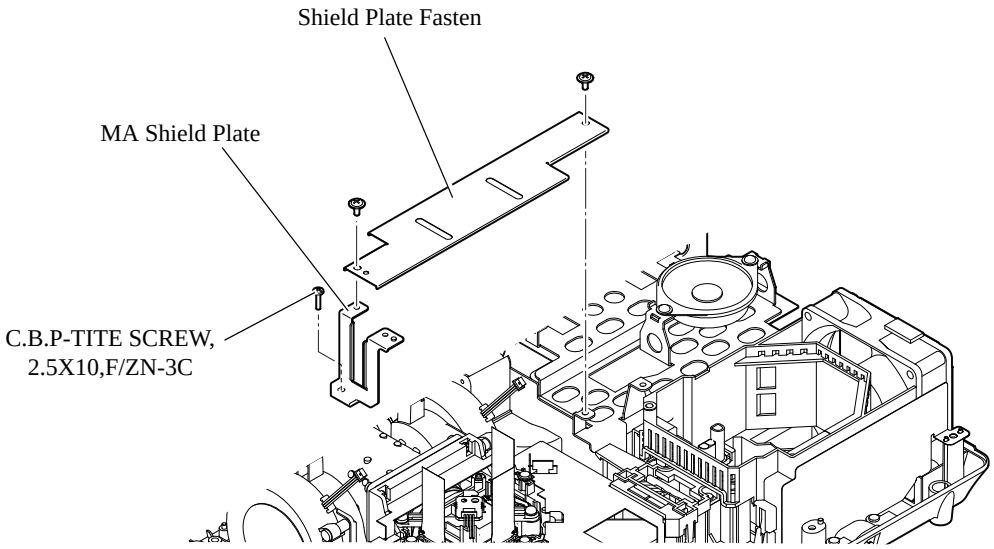
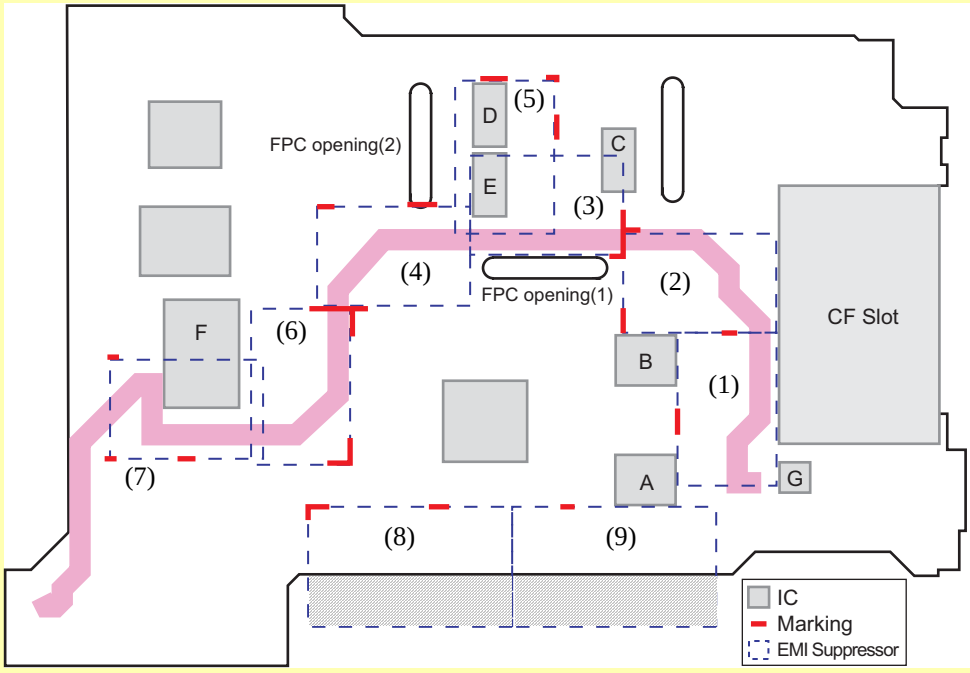


Figure 4-36.

CAUTION

■ (EMP-1825 only) When replacing IM board Assy., attach EMI suppressors (x9) following the instructions below aligning them with the markings and covering the wiring marked with pink.

(1): Align it with the right sides of IC A, B and left sides of IC G and CF slot.
(2): Align it with the top of (1) and IC B, and left side of CF slot.
(3): Align it with the left side of (2) and top of FPC opening (1) covering all IC E and lower left of IC C.
(4): Align it with the left side of (3) and bottom of FPC opening (2).
(5): Attach it over (3) and (4) covering IC D and E.
(6): Align it with the bottom side of (4).
(7): Attach it over the left side of (6) covering the lower half of IC F.
(8): Fold the shaded area at the edge and attach it to the back.
(9): Align it with the bottom of IC A and left of (8), then fold the shaded area at the edge and attach it to the back.



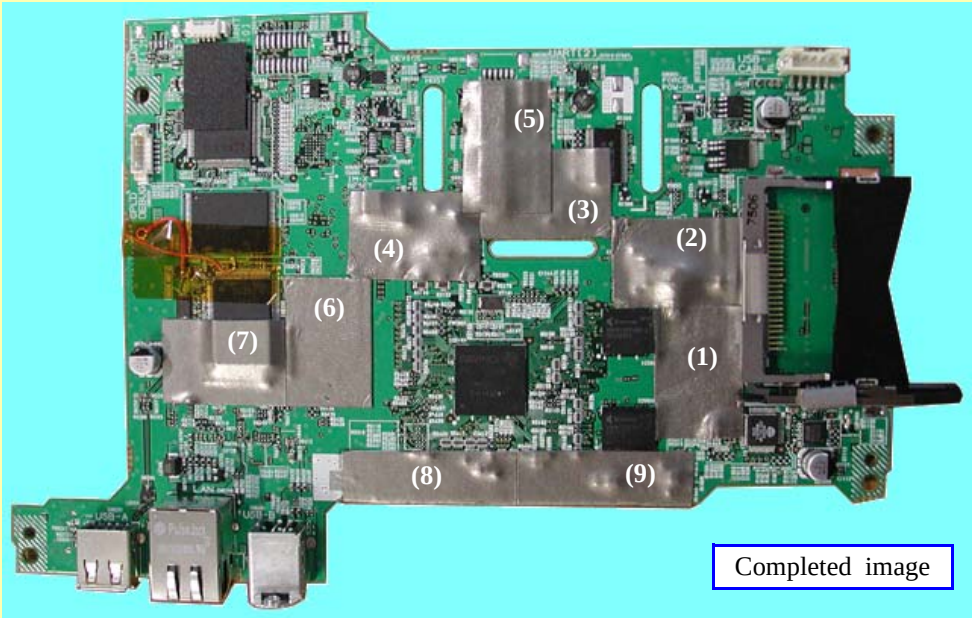


Figure 4-37.

CAUTION

■ (EMP-1815 only) When reassembling the IM Board Assy., follow the standard below.

- Attach the EMI Suppressor Sheets (x2) aligning them to the red-lined standard (allowed protrusion: 1mm outside from the lines).

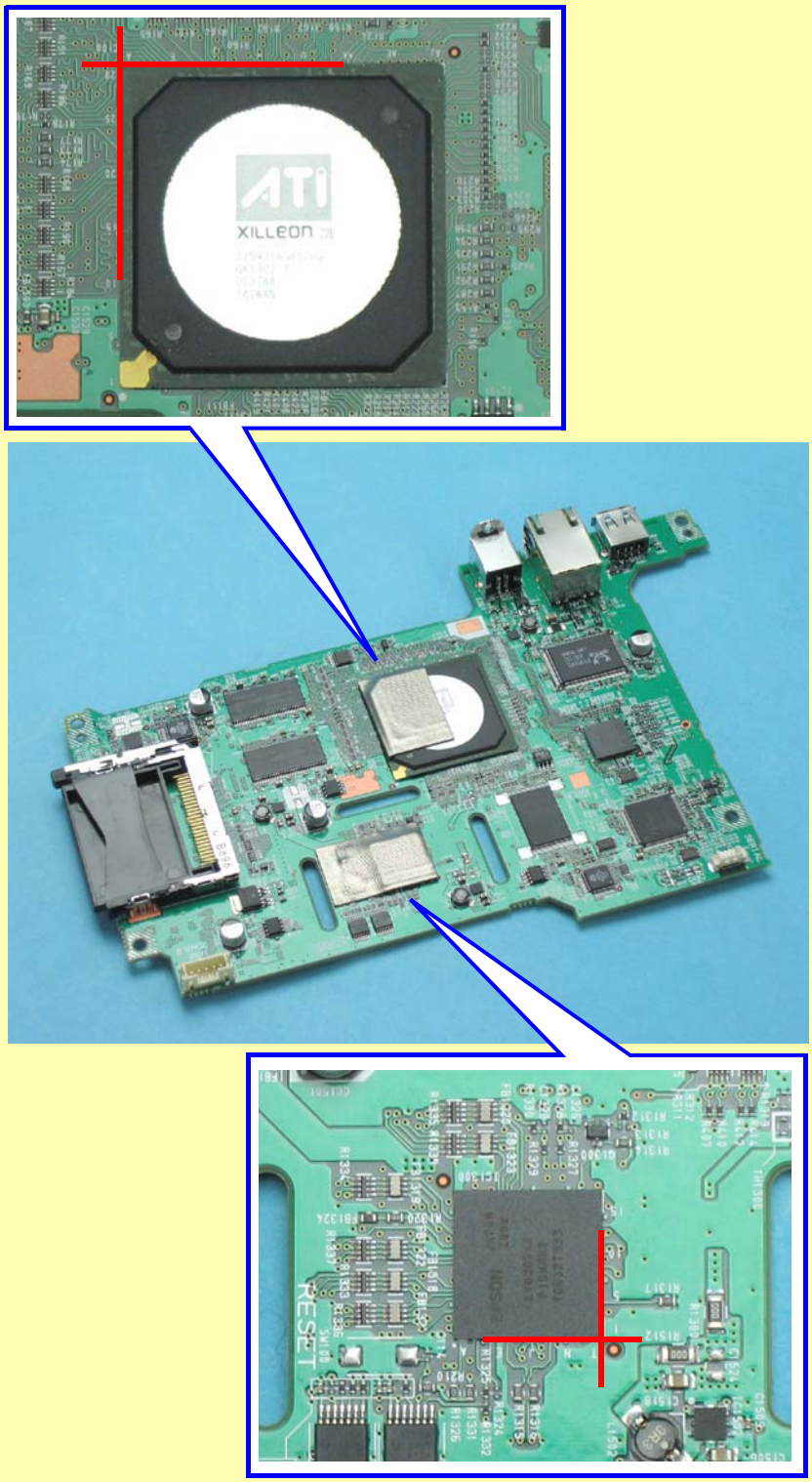


Figure 4-38.

CAUTION

- (EMP-1815/1825 only) After the CF Shading Sheet is installed as shown below, attach the Gasket (x2) to the circled places through the holes.

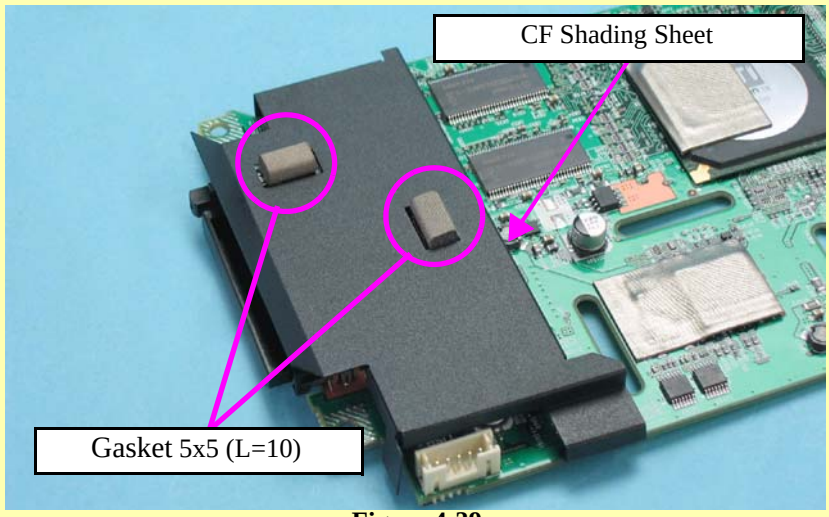


Figure 4-39.

- (EMP-1815/1825 only) Attach the USB Shading Sheet; B and the LAN Shading Sheet as shown below aligning on the IM Board's surface. Attach the Gaskets as shown in the figure below.

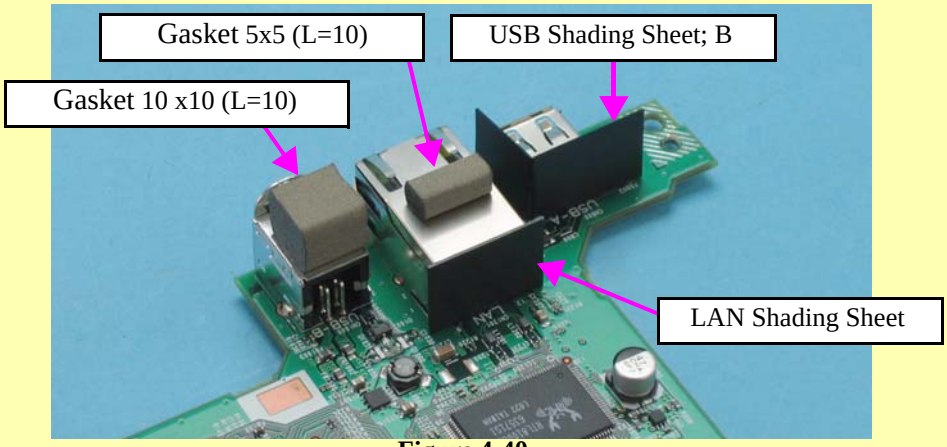


Figure 4-40.

- (EMP-1815/1825 only) Before installing the IM Shield Plate, attach the BS Sheet FIF, IM Shading Sheet, Connector Shading Sheet according to the red-lined standard as shown in the figure below.

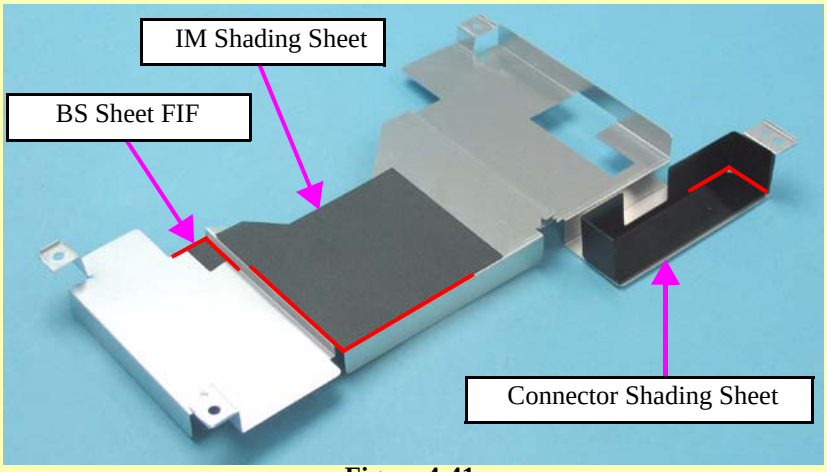


Figure 4-41.

CAUTION

■ (EMP-1815/1825 only) After installing the IM Shield Plate and the IM Fastening Plate to the IM Board Assy., attach the Gasket to the specified place shown below in the direction of the arrow upward.

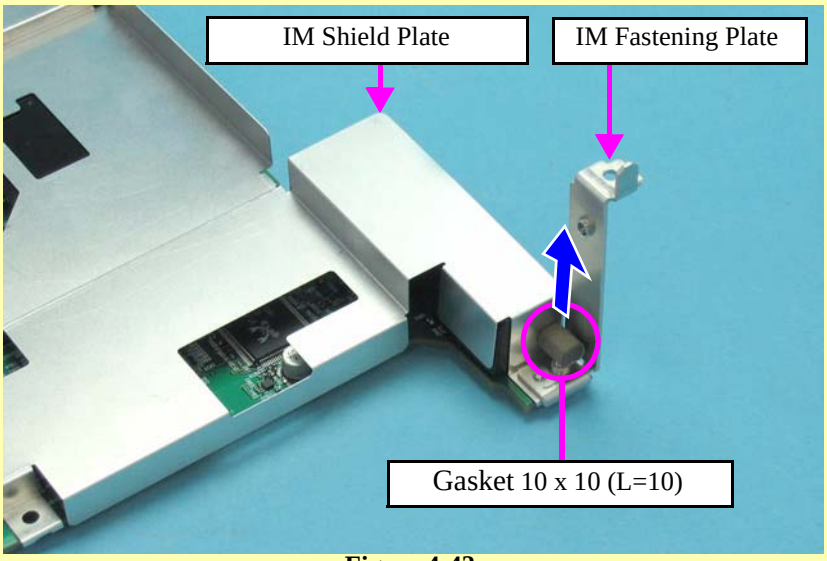


Figure 4-42.

■ (EMP-1815/1825 only) When installing the IM Board Assy., be careful about the following direction.

- Route the Cables from the RC board and the PBS Fan as shown in the figure below.

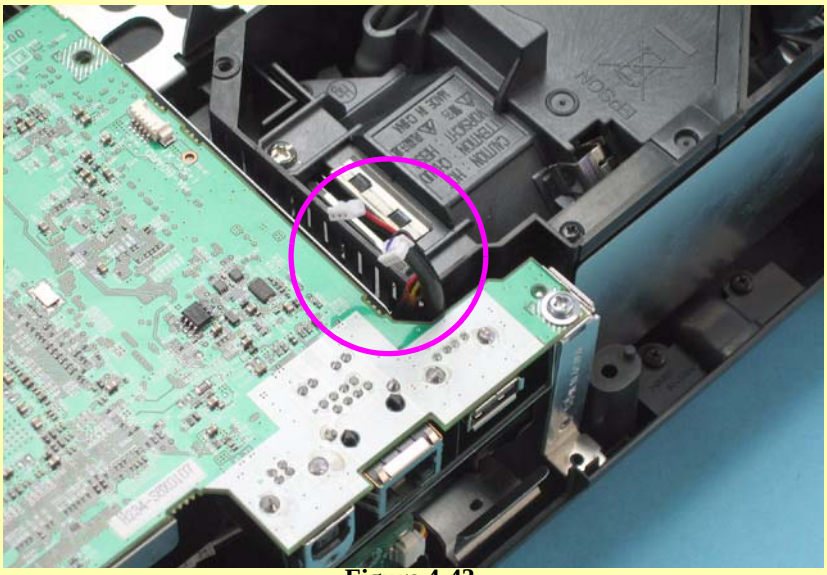


Figure 4-43.

CAUTION

- Set the bead core and the ferrite core of the USB cable as shown in the figure below.

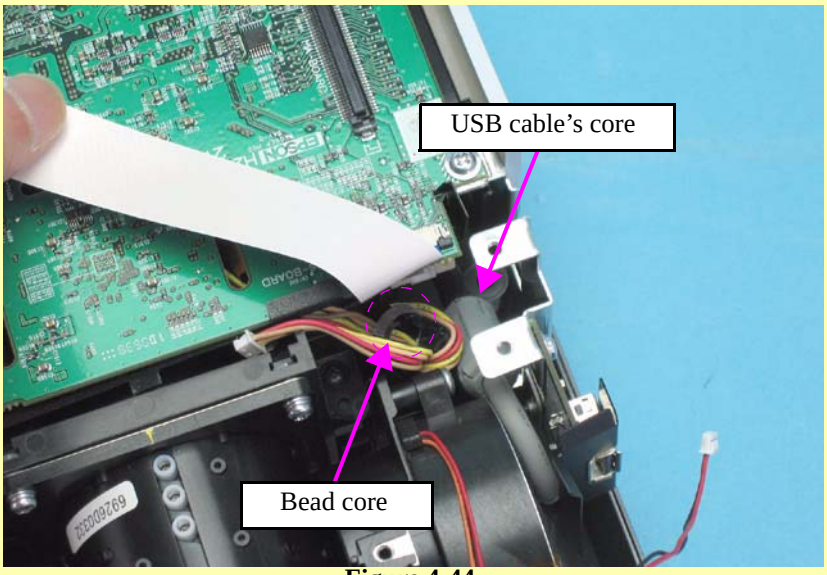


Figure 4-44.

- Attach the Conduction Plate; Fan of the USB Board Assy contacting with the metal part of the Intake Fan.

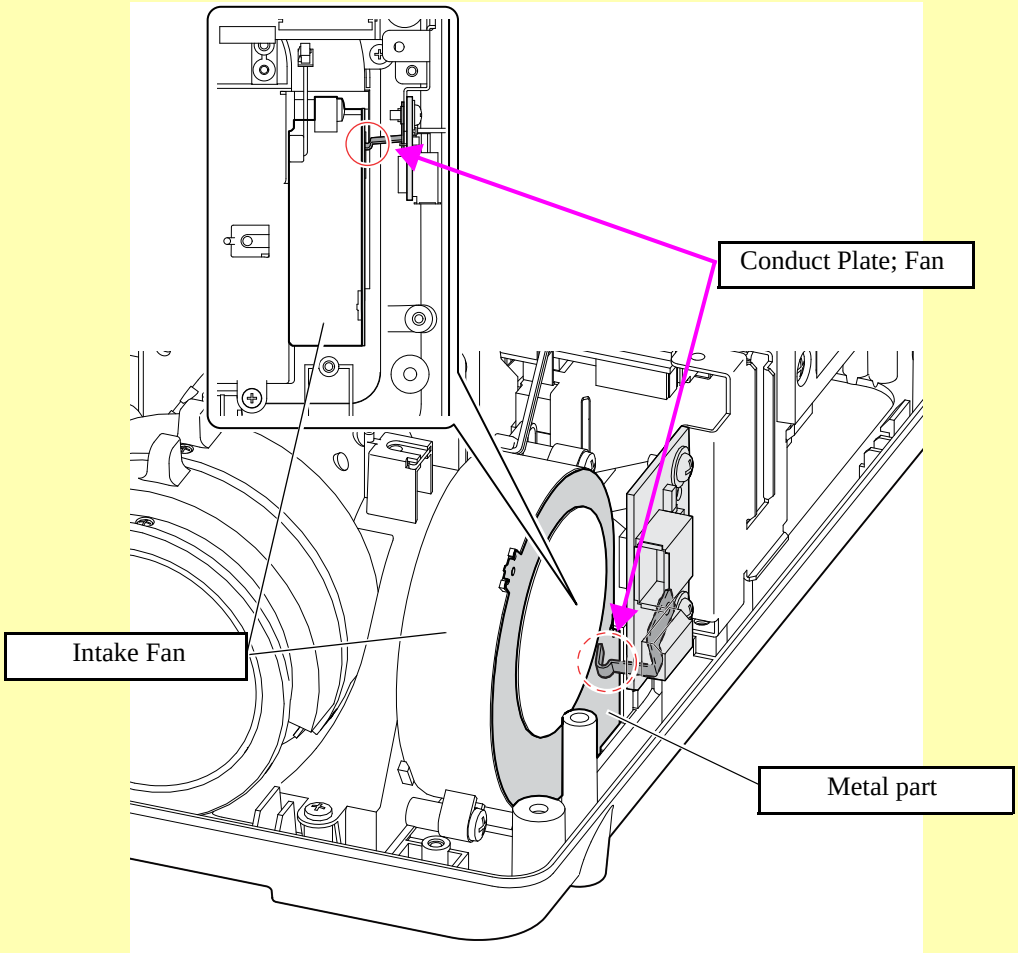


Figure 4-45.

■ Removing the USB Board Assy./CF Slot Assy. (EMP-1825/1815 only)

16).Remove the two screws (C.C.SCREW,3X6,F/ZN-3C) that secure the USB Board Assy. from the CF Plate, and remove the USB Board Assy and Conduction Plate; Fan.

17).Remove the USB Shading Sheet from the USB Board Assy.

18).Remove the two screws (C.B.SCREW,3X8,F/ZB-3C) that secure the CF Slot Assy. from the CF Plate, and remove the CF Slot Assy.

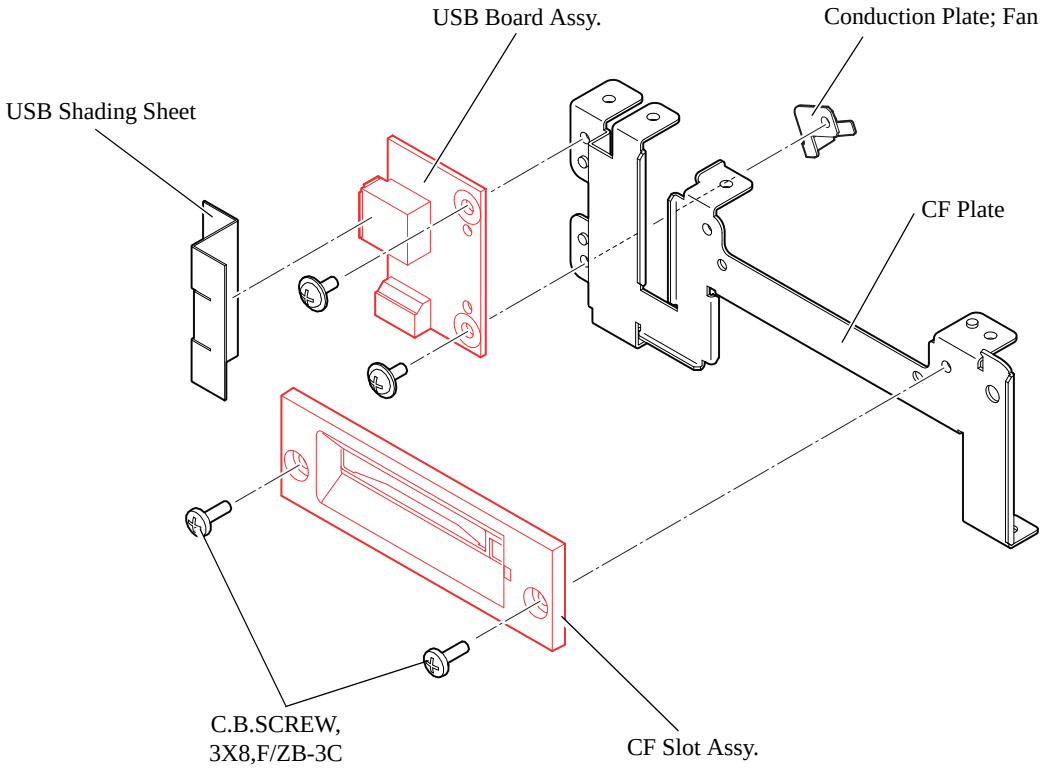


Figure 4-46.

CAUTION

■ (EMP-1815/1825 only) When reassembling the USB Board Assy., attach the USB Shading Sheet drawing out the connector's ribs from the hole as shown in the figure.

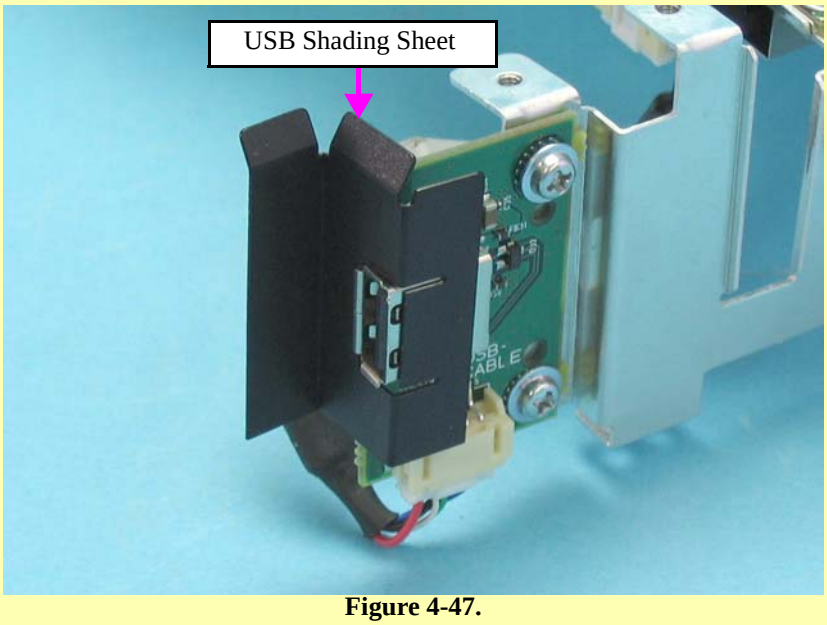


Figure 4-47.

■ (EMP-1815/1825 only) When installing the Conduction Plate; Fan, follow the standard below

- Align it at an angle of 25°±5° from the bottom of the board as shown in the figure below.

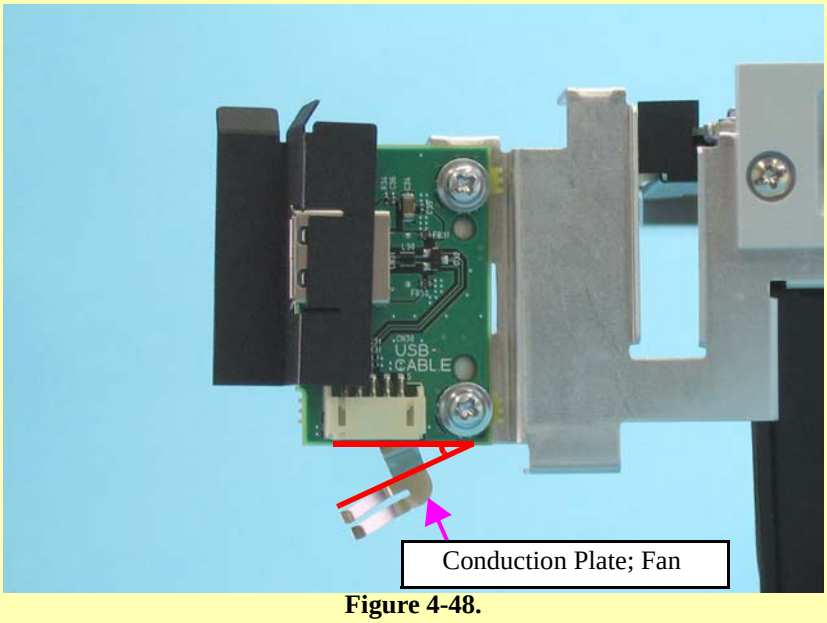


Figure 4-48.

4.4.2 Removing the Inner Exhaust Duct B/TH Board Assy.

1. Remove the screw (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secures the Cover Inner EX Duct B, and remove the Cover Inner EX Duct B from the Inner Exhaust Duct B.
2. Remove the screws (x2: C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the Inner Exhaust Duct B, and remove the Inner Exhaust Duct B.
3. Remove the TH Board Assy. from the Inner Exhaust Duct B.

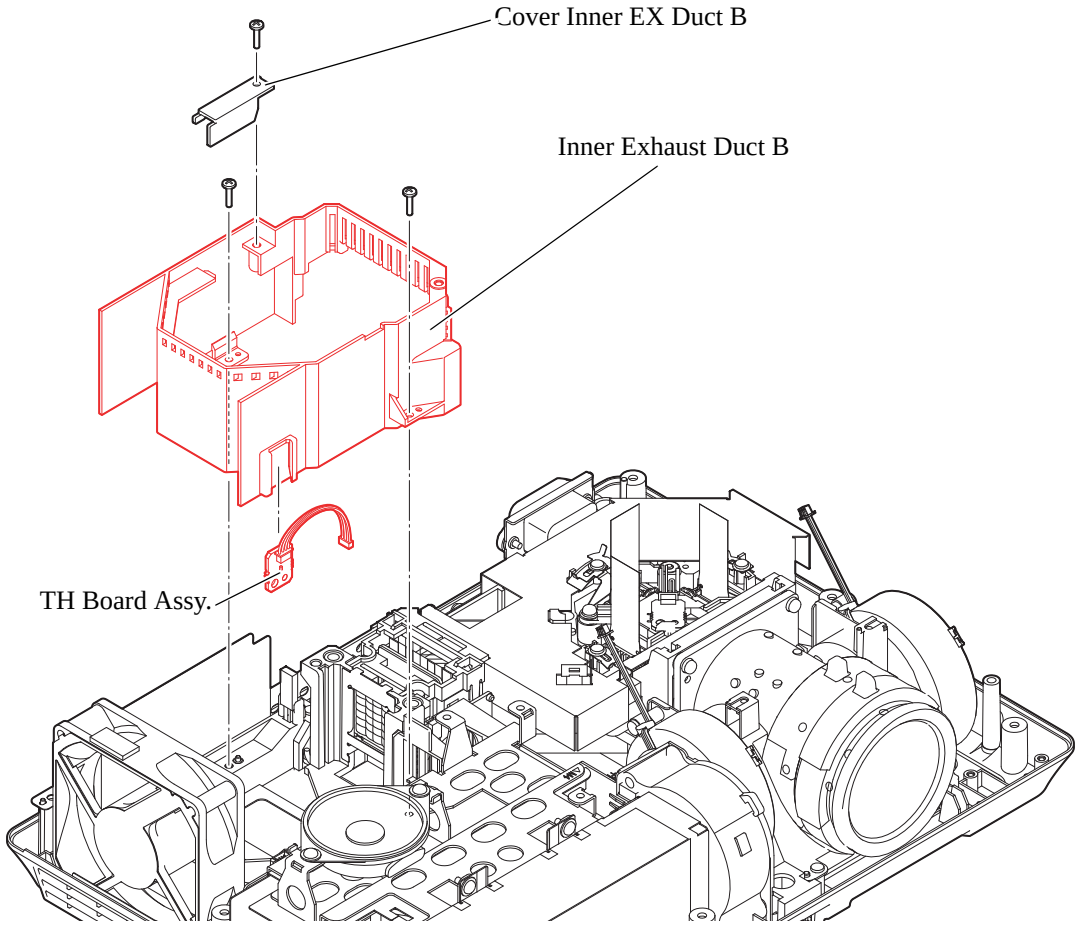


Figure 4-49.

CAUTION

■ When installing the Inner EX duct B, set the Safety Switch into the notch of the duct as shown in the figure below.

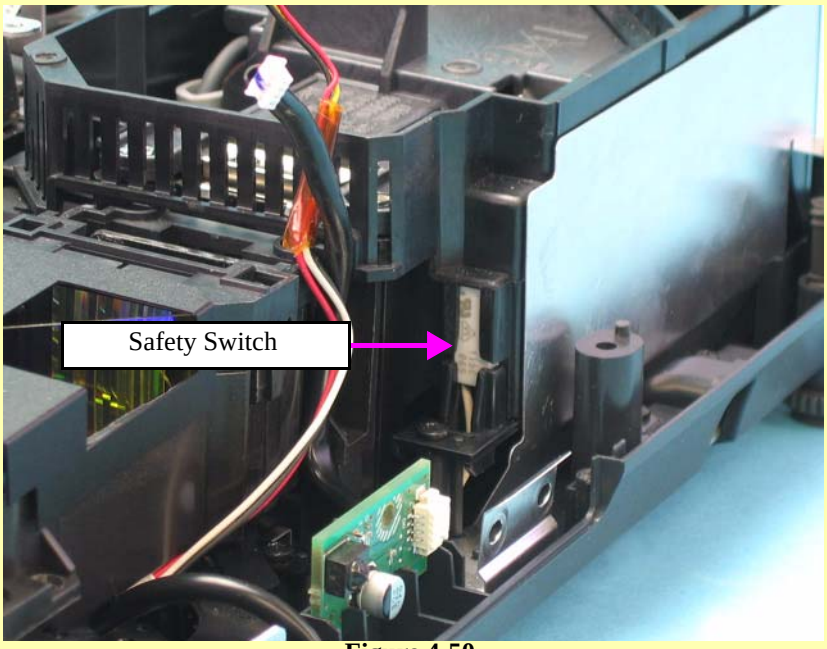


Figure 4-50.

4.4.3 Removing the Optical Engine and MAB (2) (Optical Engine)

1. Remove the LG Shading Sheet.
2. Remove the four screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the Optical Engine, and remove the Optical Engine.

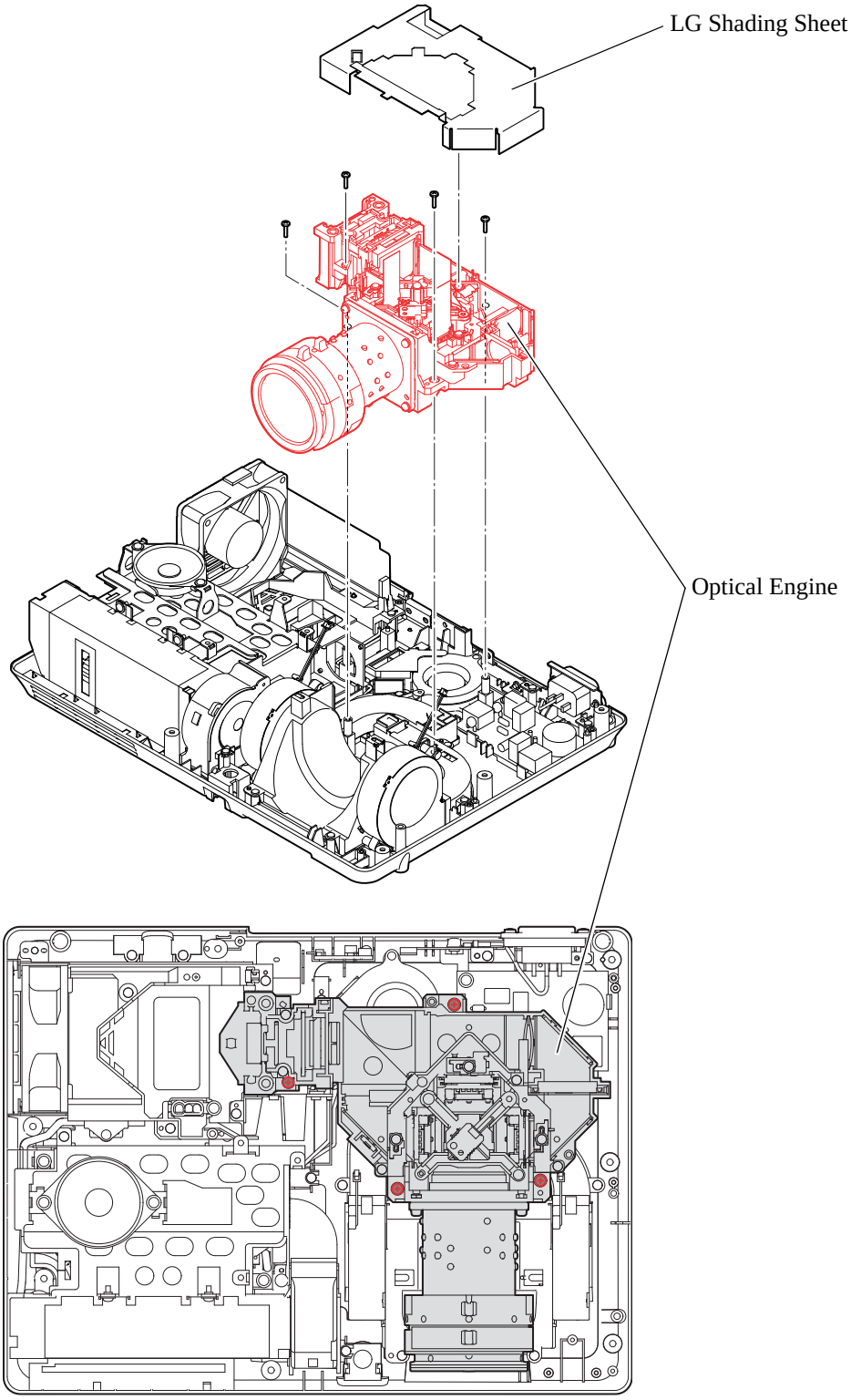


Figure 4-51.

CAUTION

■ When installing the Optical Engine, follow the directions below.

1). Route the cable of the L/V thermistor as shown below.

2). Attach the LG Shading Sheet aligning the red-circled parts as shown in the figure below.

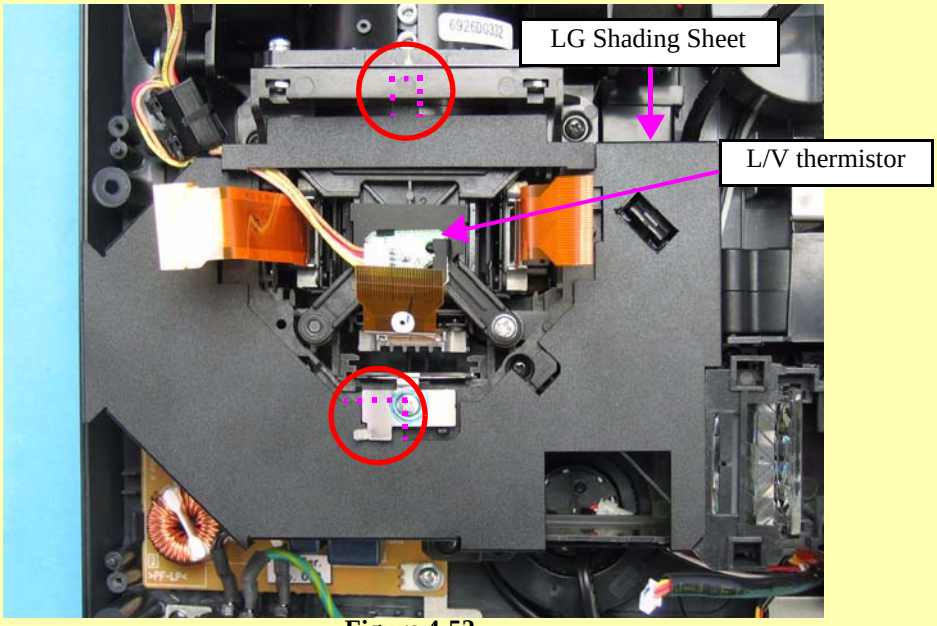


Figure 4-52.

3). Set the bead core between the Intake Fan and the Optical Engine.

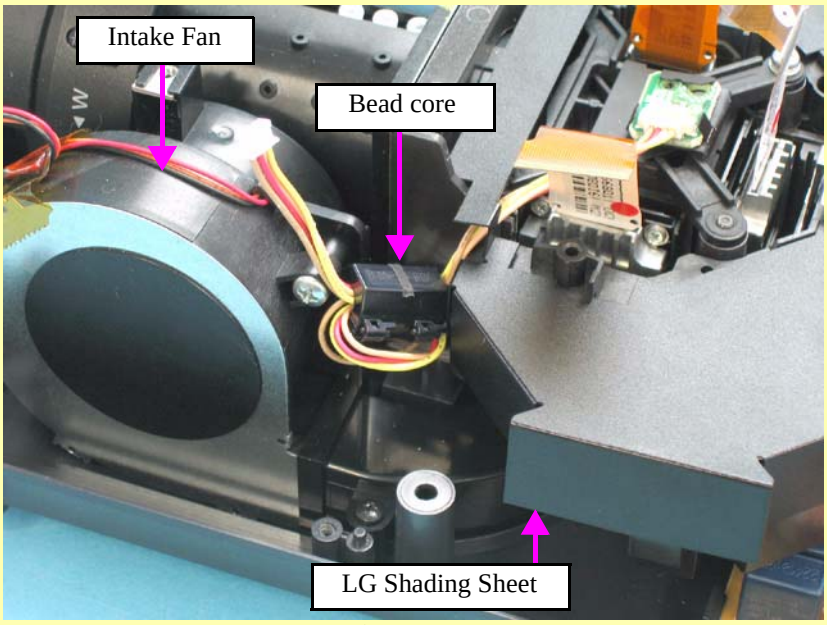


Figure 4-53.

CAUTION

When sending the replaced Optical Engine and MAB set to the repair center, be sure to send all the parts listed below.

Table 4-3. Components of Optical Engine and MAB set

Part name	qt.
Optical Engine	1
MA Board Assy.	1
IF Board Assy.	1
IF Plate	1
IF Shading Sheet	1
Heat Sink; A	3
EMI Suppressor Sheet;C	1
Heat Sink; PW	1
LG Shading Sheet	1
PJ Lens Cover Cushion	2
LAN Shading Sheet (EMP-1810 only)	1

4.4.3.1. Removing the Focus Ring/Zoom Ring

1. Remove the three screws (C.P.TYPE3 B-TITESCREW,1.7X4,F/ZB-3C) that secure the Focus Ring, and remove the Focus Ring.
2. Remove the three screws (C.P.TYPE3 B-TITESCREW,1.7X4,F/ZB-3C) that secure the Zoom Ring, and remove the Zoom Ring.

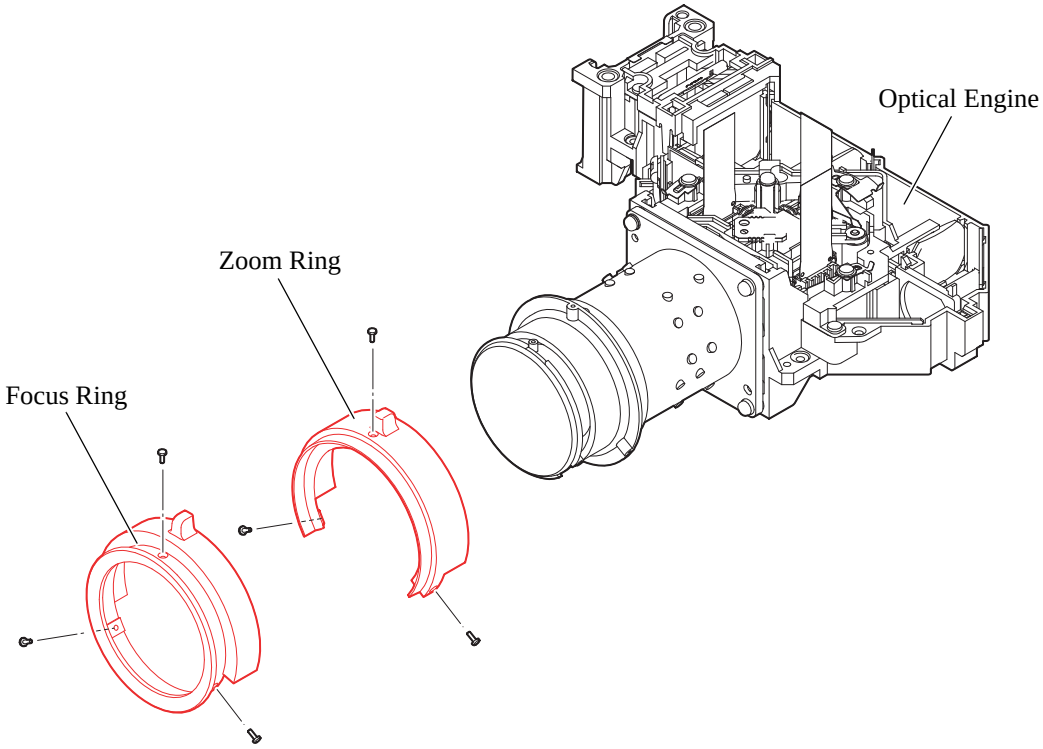


Figure 4-54.

4.5 Removing Other Main Parts

4.5.1 Removing the Inner Exhaust Duct A/Exhaust Fan Assy.

1. Remove the screw (C.C.SCREW,3X6,F/ZN-3C) that secures the Lamp Connector, and release the Lamp Connector from the Inner Exhaust Duct A.
2. Remove the three screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the Inner Exhaust Duct A, and remove the Inner Exhaust Duct A while drawing out the Safety Switch from the hole of the Inner Exhaust Duct A.
3. Remove the Exhaust Fan Assy. from the Inner Exhaust Duct A.

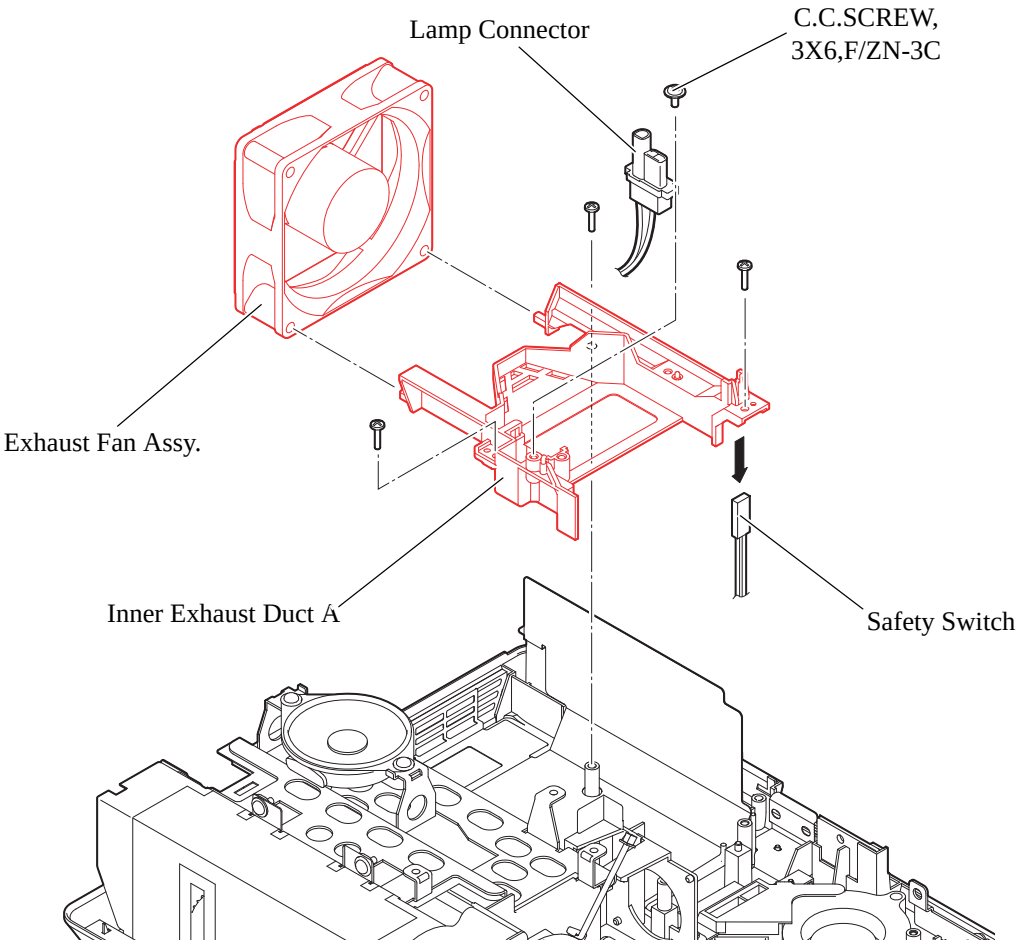


Figure 4-55.

CAUTION

■ When installing the Inner EX Duct; A, set the Safety Switch through the hole as shown in the figure below.

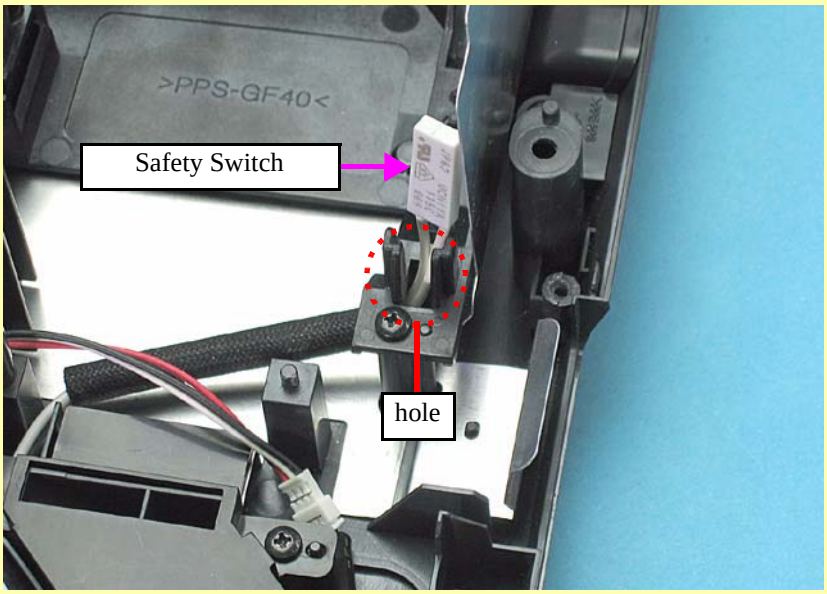


Figure 4-56.

4.5.2 Removing the PS Fan/PS Ballast Assy./Speaker

■ Removing the PS Fan

1). Remove the two screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the PS Duct, and remove the PS Duct together with the PS Fan from the Lower Case.
2). Remove the PS Fan from the PS Duct.
3). Remove the two BS Sheet FIFs from the PS Duct.

■ Removing the PS Ballast Assy.

4). Remove the screw (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secures the Lamp cable.
5). Remove the screw (C.P.(S-P1)SCREW,4X6,F/ZN-3C) that secures the PS Ballast Assy.'s GND.
6). Remove the two screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the PS Ballast Assy.
7). Disconnect the AC cable from the connector on the PS Ballast Assy., and remove the PS Ballast Assy.

■ Removing the Speaker

1). Remove the two screws (C.C.SCREW,3X6,F/ZN-3C) that secure the Speaker, and remove the Speaker from the PS Ballast Assy.

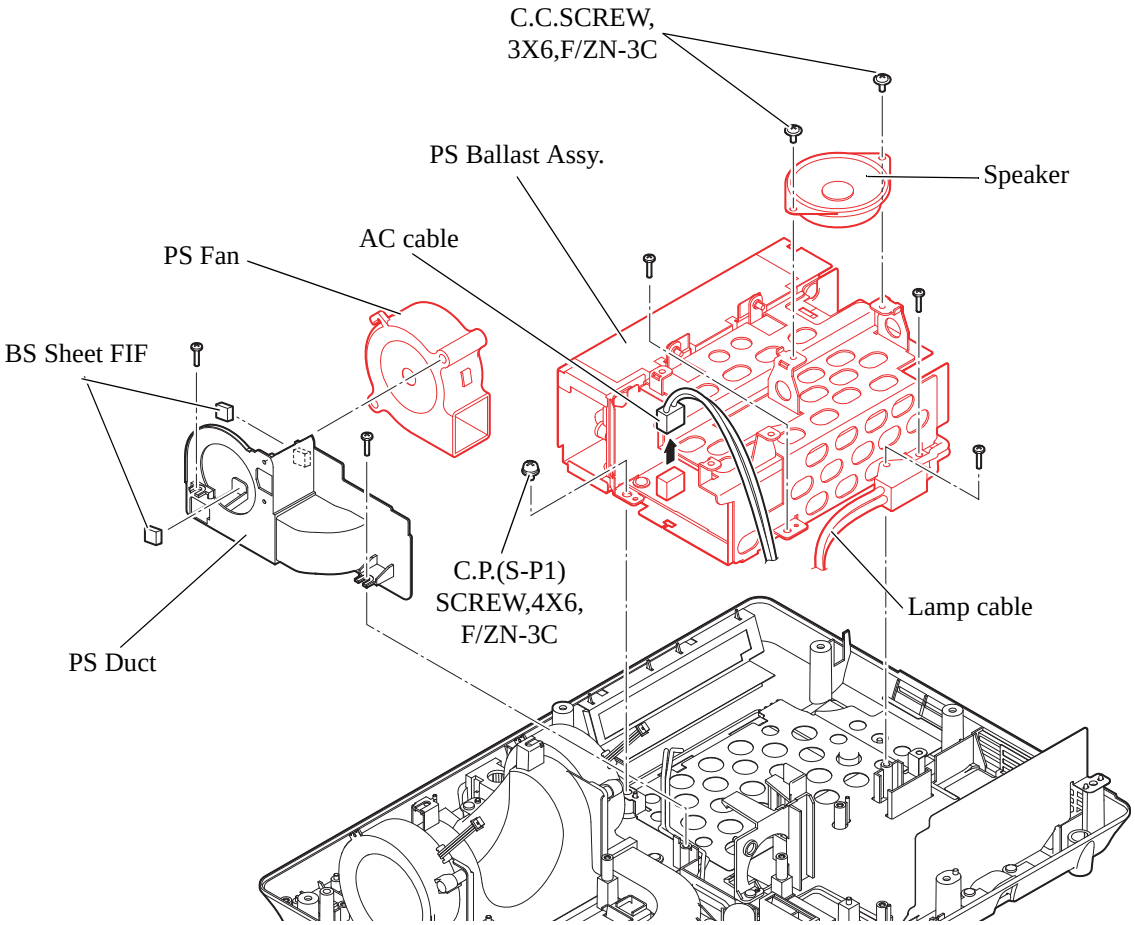


Figure 4-57.

CAUTION

■ When reassembling the PS Duct, attach the BS Sheet FIF (x2) according to the standard shown in the figure below.

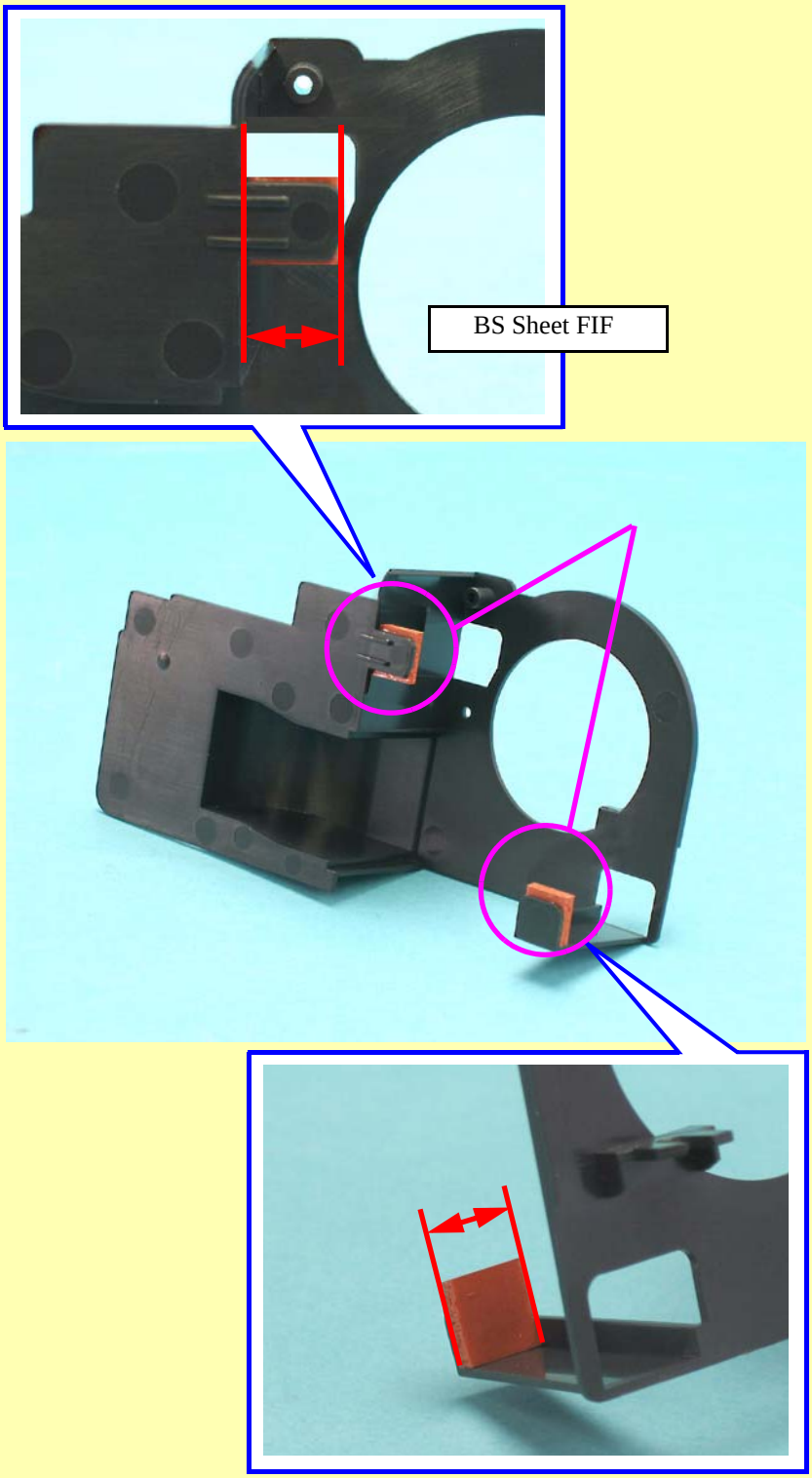


Figure 4-58.

CAUTION

■ Follow the procedure below to install the PS Ballast Assy.

1). Route the Lamp Cable (igniter not-attached side) as shown below.

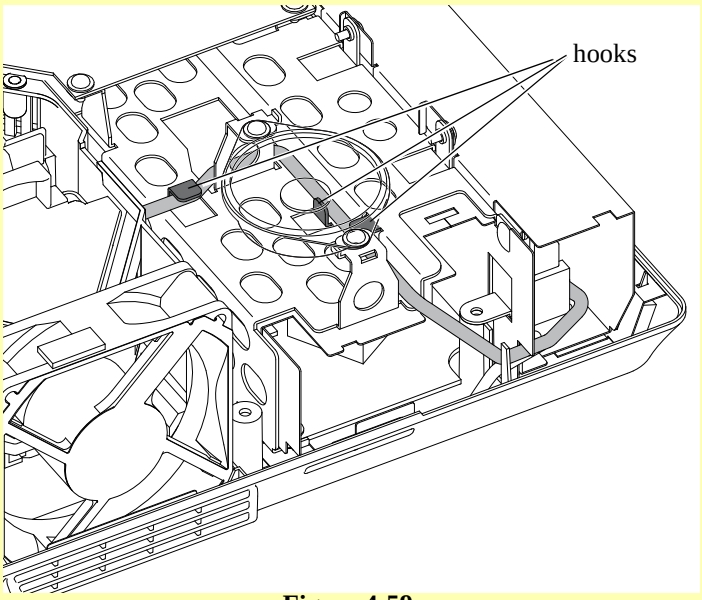


Figure 4-59.

2). Route the Lamp cable (igniter attached side) through the groove indicated by the red box in the figure below. Make sure that the Lamp cable is not routed under the PS Board.

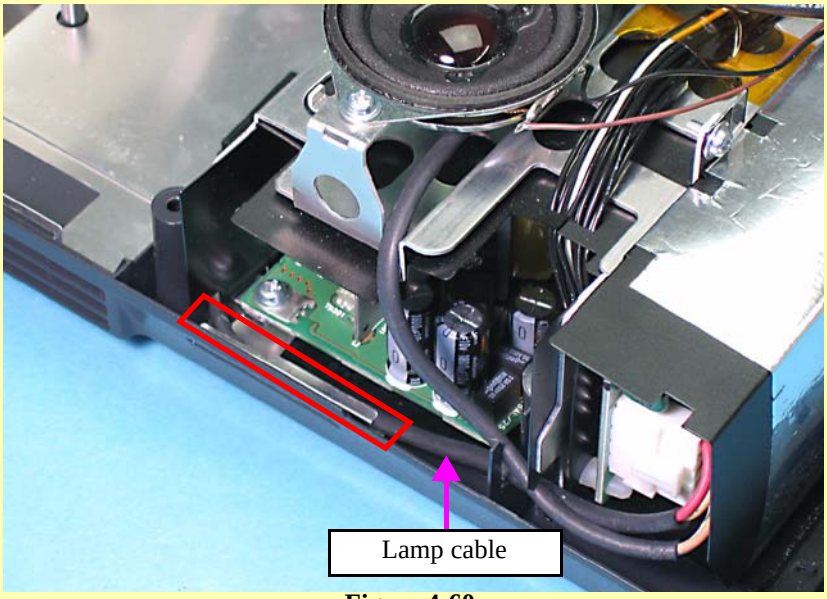


Figure 4-60.

4.5.3 Removing the PS Ballast Assy.(2) (Filter Board Unit)/Lamp Fan

■ Removing the Filter Board Unit

1). Remove the two screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the AC Inlet Fastening Plate.
2). Disconnect the AC Cable from the connector on the Filter Board Unit, and unlock the three hooks and remove the Filter Board Unit together with the AC Inlet Fastening Plate.
3). Remove the screw (C.P.(S-P1)SCREW,4X6,F/ZN-3C) that secures the AC Inlet's GND cable.
4). Remove the two screws (C.B.SCREW,3X8,F/ZB-3C) that secure the AC Inlet, and remove the AC Inlet Fastening Plate.
5). Remove the screw that secures the Filter Board Unit's GND, and remove the Filter Board Unit.

■ Removing the Lamp Fan

6). Remove the two screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the Lamp Duct, and remove the Lamp Duct together with the Lamp Fan from the Lower Case.
7). Remove the Lamp Fan from the Lamp Duct.
8). Remove the two BS Sheet FIF from the Lamp Duct.

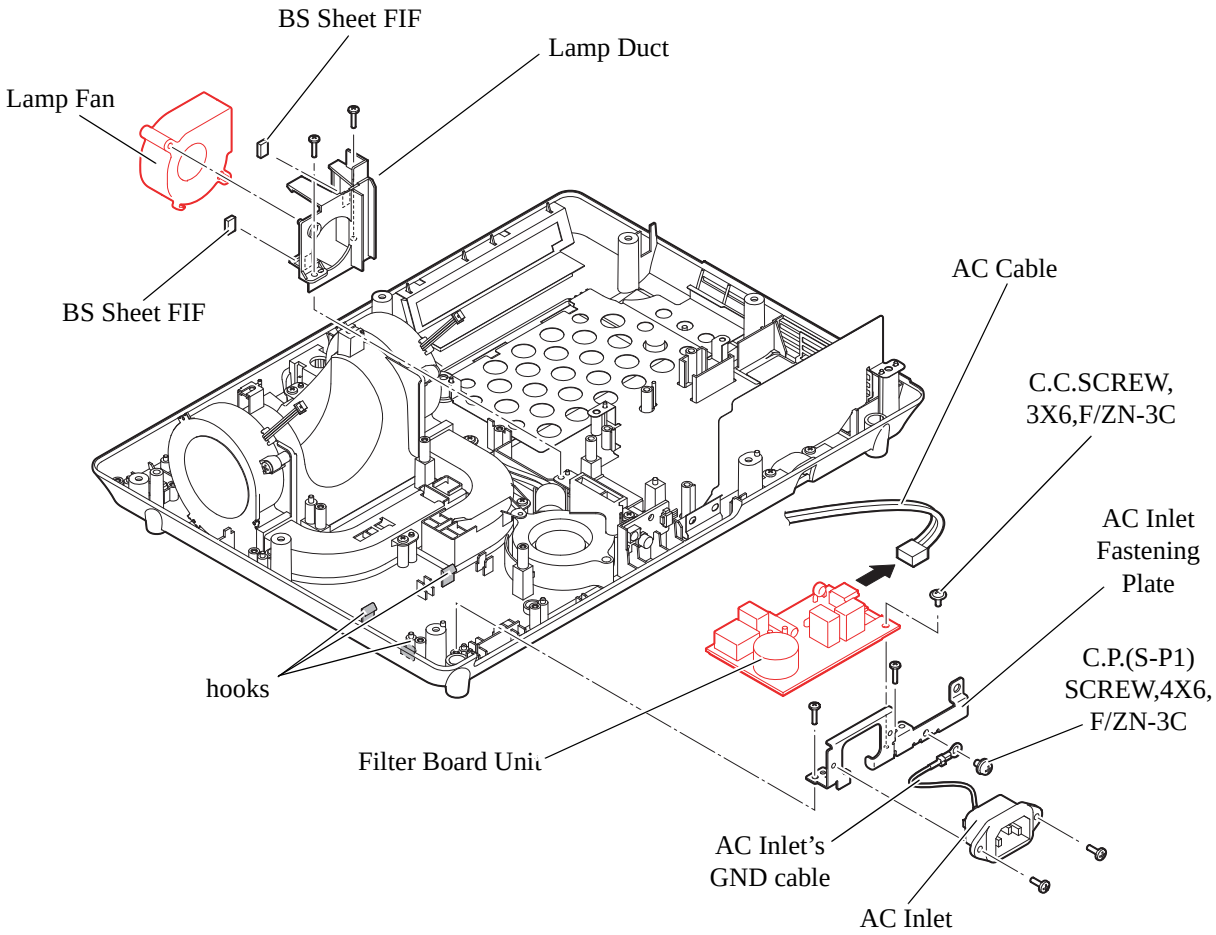


Figure 4-61.

CAUTION

■ When installing the Filter Board Unit, make sure to observe the following points.

- The black cable must cross over the white cable.
- The fuse holder must not contact with the cable

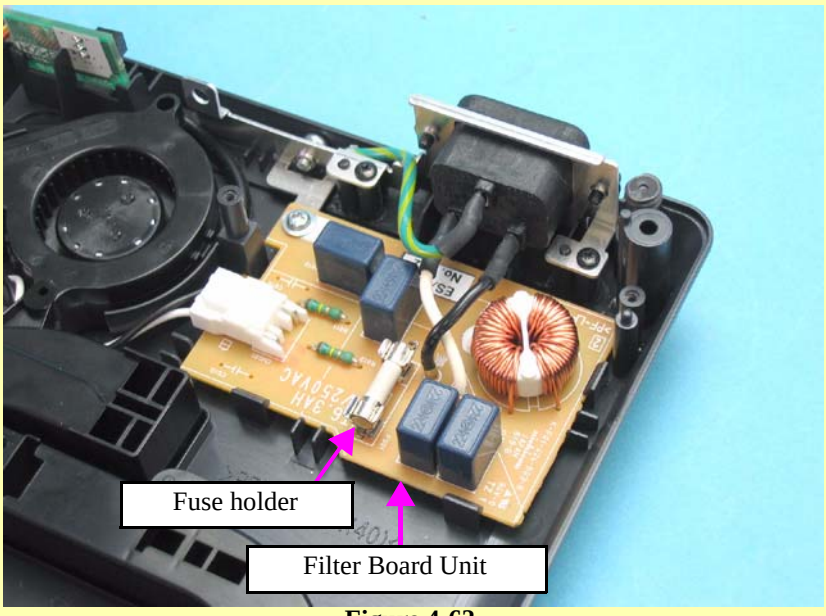


Figure 4-62.

■ Before installing the Lamp Duct, attach the BS sheets to the Lamp Duct. Make sure to align the sheets' corners with the corners indicated by the red lines in the figure (within an error of ± 1 mm).

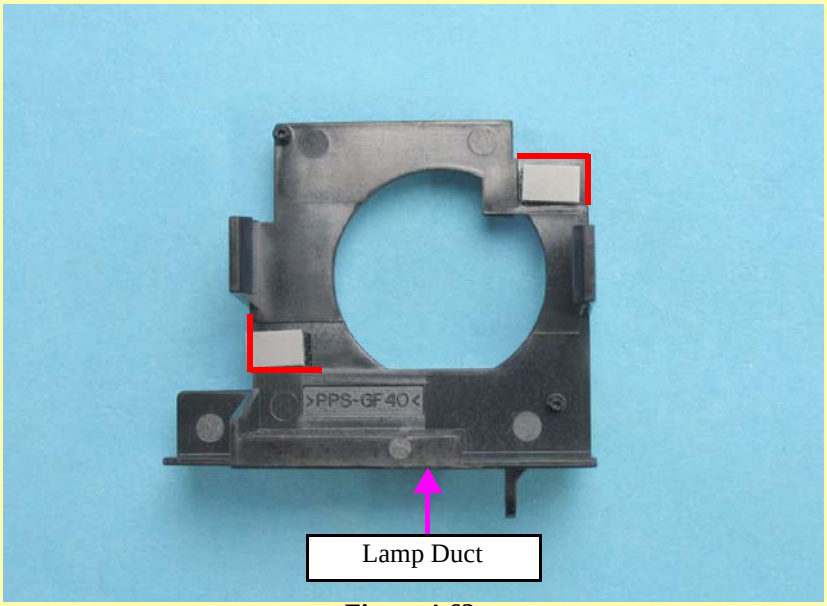


Figure 4-63.

CAUTION

■ After installing the Lamp Fan, make sure that the AC cable and the PBS Fan cable are properly fastened at the three points indicated by the red circles in the figure.

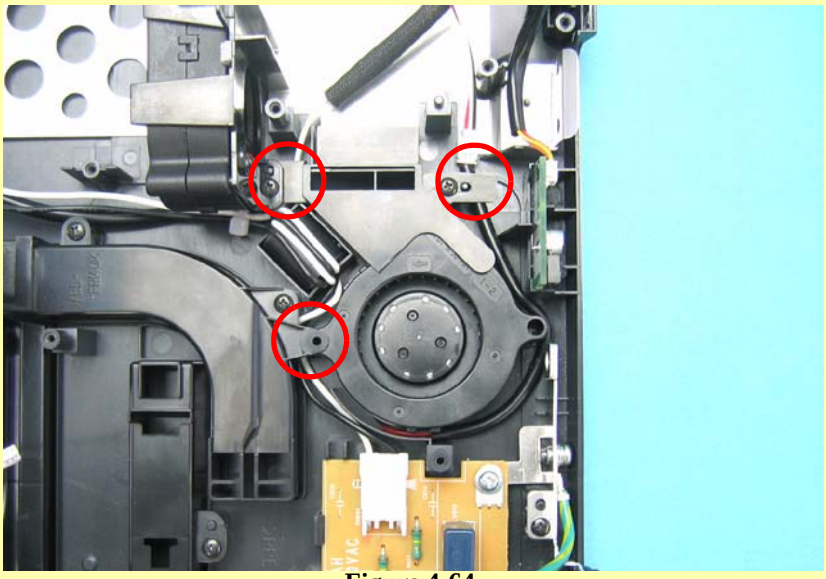


Figure 4-64.

4.5.4 Removing the Intake Fan/PBS Fan/AC Cable/RC Board Assy.

■ Removing the Intake Fan

1). Remove the six screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the Intake Duct, and remove the Intake Duct from the Lower Case.
2). Remove the two Fastening Plate A from the Intake Duct.
3). Remove the four screws (two each: C.B.P-TITE SCREW,3X12,F/ZN-3C) that secure the two Intake Fans from both the sides of the Intake Duct, and remove the Intake Fans.
4). Remove the two Intake Fan Sheet (one each) from the Intake Fans.
5). Remove the two BS Sheet FIF (one each) from the Intake Duct.

■ Removing the PBS Fan/AC Cable

6). Remove the screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secures the PBS Duct, and remove the PBS Duct together with the PBS Fan from the Lower Case.
7). Remove the CB Relay Cable from the PBS Fan.
8). Remove the Ferrite Core of the AC Cable from the fastening hole on the Lower Case, and remove the AC Cable.
9). Remove the Intake Fan Cushion A from the Lower Case.

■ Removing the RC Board Assy.

1). Remove the RC Board Assy. from the Lower Case.
2). Remove the TH Cable FIF from the RC Board Assy.

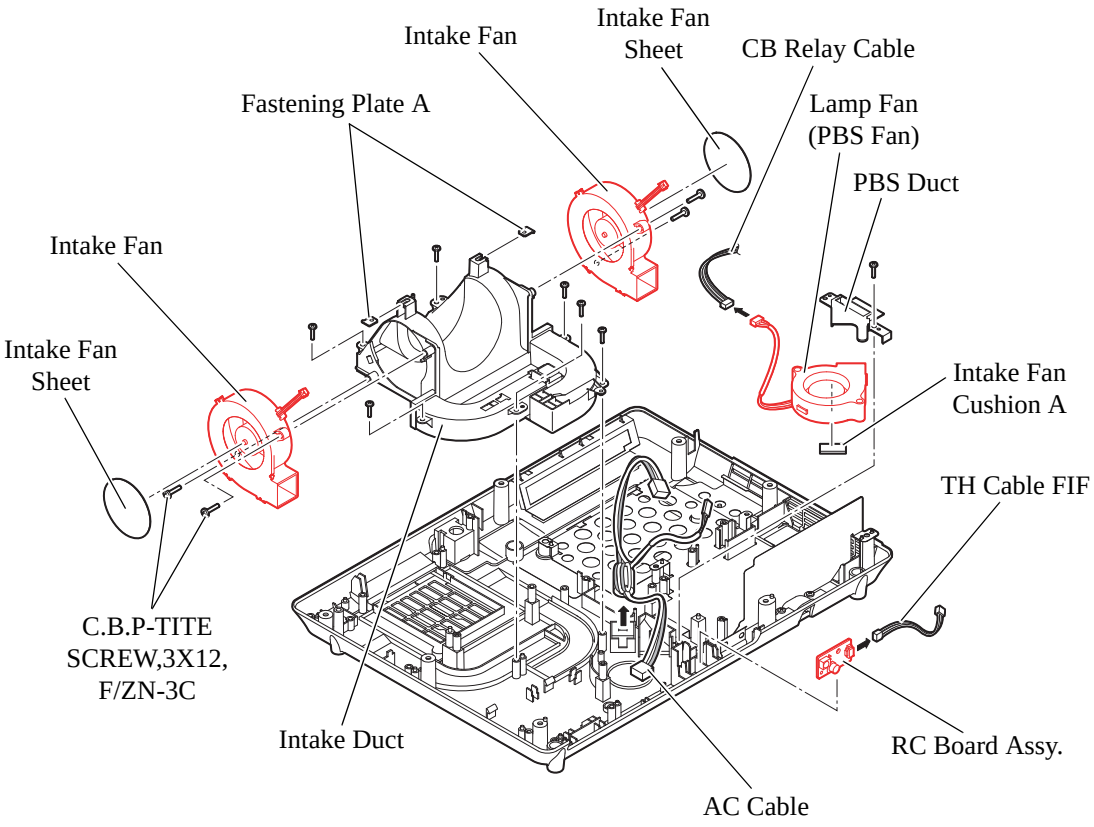


Figure 4-65.

CAUTION

■ Follow the procedure below to install the AC cable.

1). Make sure that the ferrite core is inserted all the way into the slot of the Lower Case.

2). Route the AC cable as shown below.

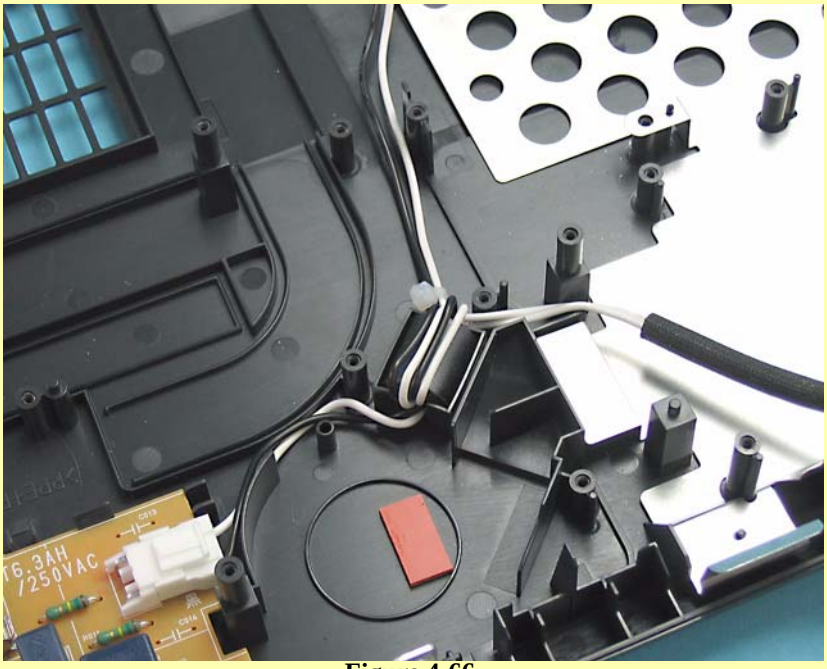


Figure 4-66.

■ Before installing the Intake Fan, attach the Intake Fan Sheet to the fan. Make sure to align the arc of the sheet with the arc of the fan where the fan cable comes out.

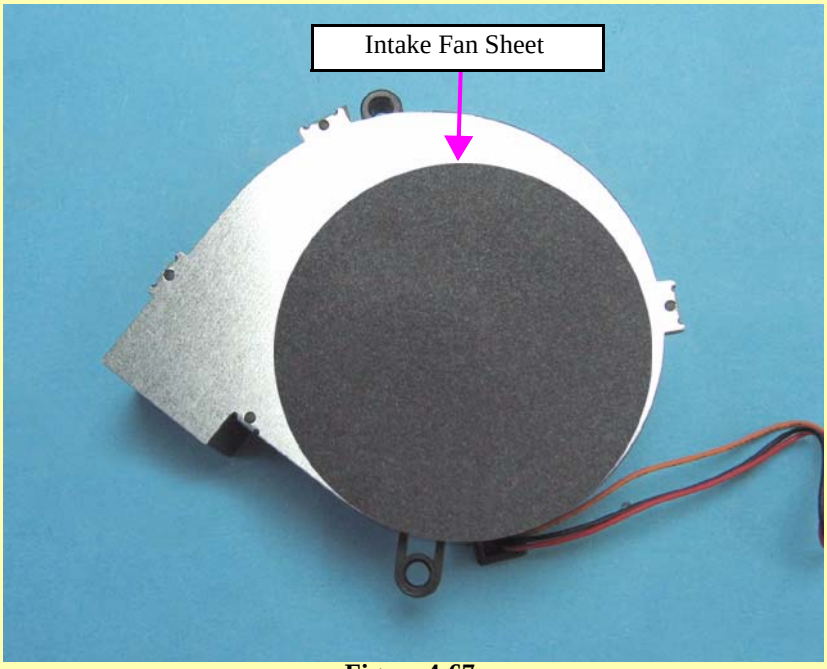


Figure 4-67.

CAUTION

■ Follow the procedure below to install the PBS Fan.

1). Attach the Intake Fan Cushion A as shown below.

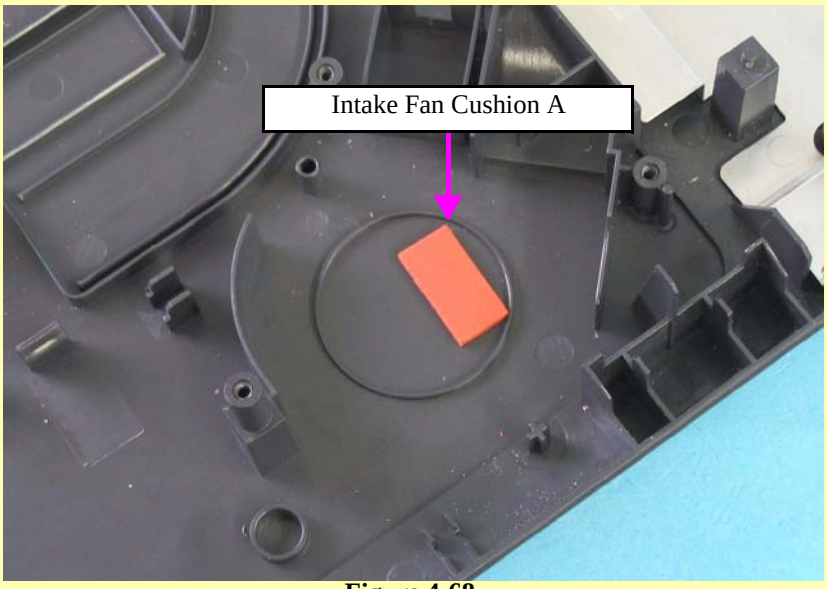


Figure 4-68.

2). Route the cable of the PBS Fan as show below. Be careful not to let the cable go upper side from the red line shown in the figure.

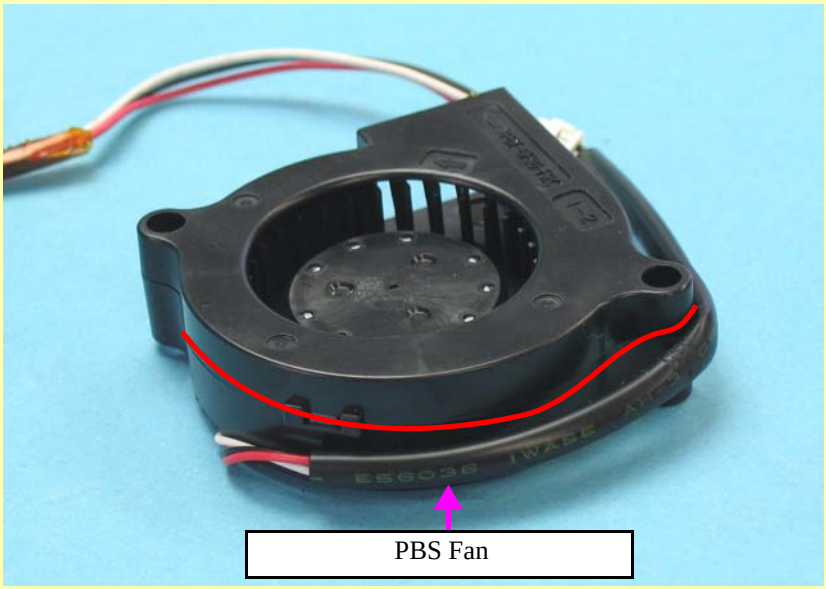


Figure 4-69.

CAUTION

3). Install the PBS Fan to the Lower Case retaining the cable routed at Step 2.

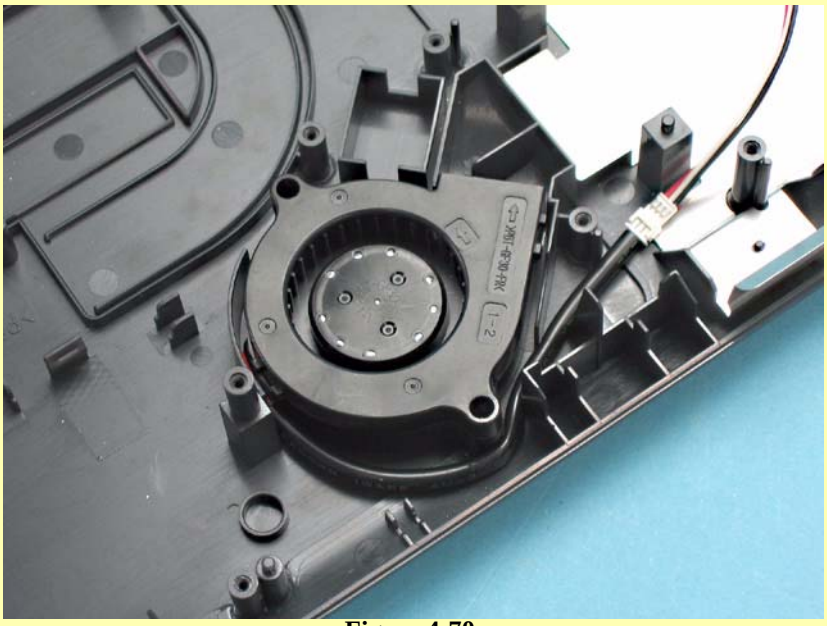


Figure 4-70.

4.5.5 Removing the Ballast Filter Assy./Security Bar/Lower Case

1. Remove the Ballast Filter Assy. from the Lower Case.
2. Remove the Lower Shield Plate from the Lower Case.
3. Remove the two screws (C.B.P-TITE SCREW,2.5X10,F/ZN-3C) that secure the Security Bar Cover, and remove the Security Bar Cover and the Security Bar from the Lower Case.
4. Remove the two gaskets (5x5L=10) from the Lower Shield Plate.
5. Remove the following parts from the Lower Case.
   (a) BS Sheet FIF

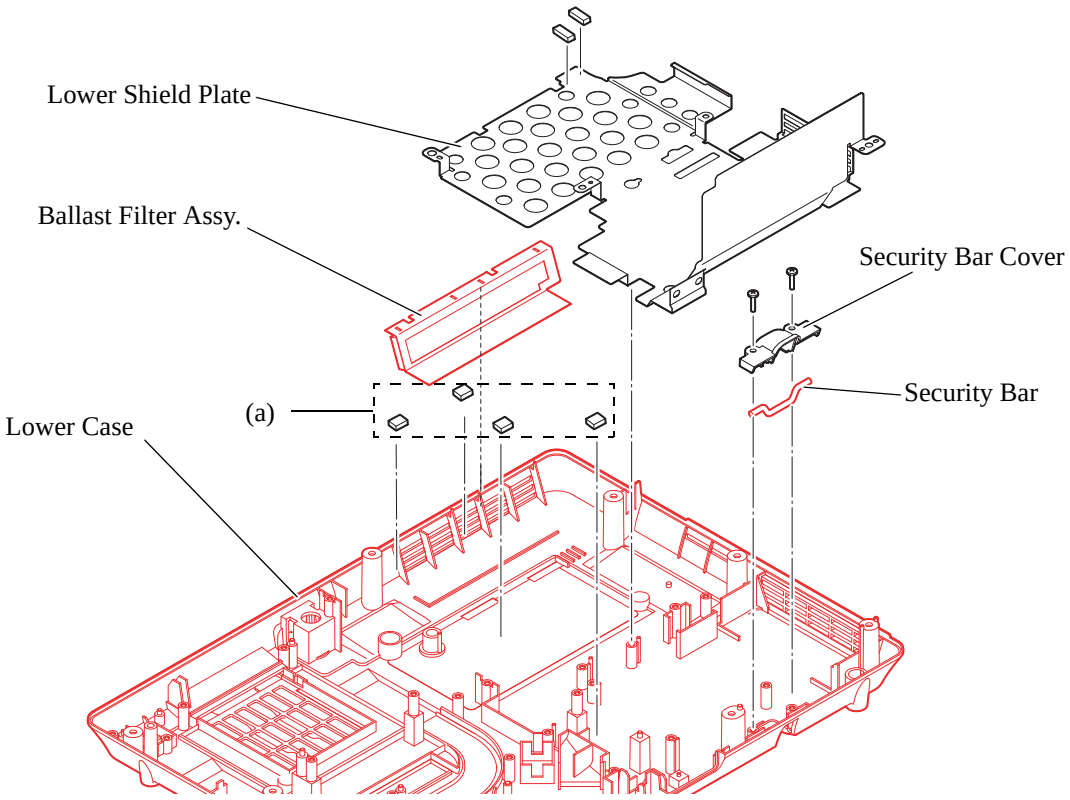
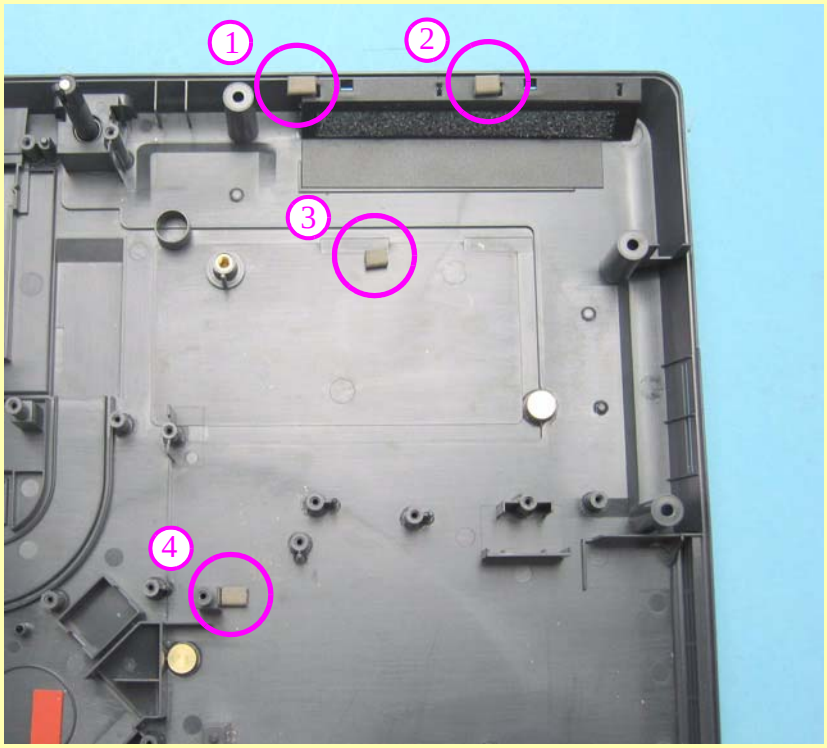


Figure 4-71.

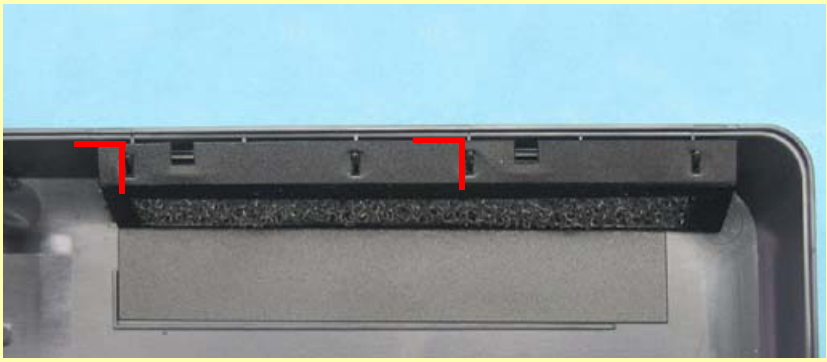
CAUTION

■ Make sure to observe the following points to install the Lower Case.

- Attach the four gaskets aligning their corners with their respective reference red lines (within an error of ± 0.5 mm).



Reference lines for 1 and 2



Reference lines for 3

Reference lines for 4

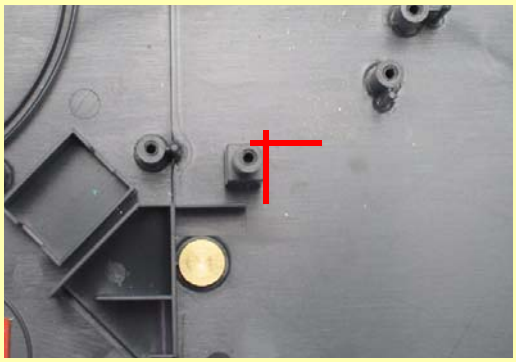


Figure 4-72.

CAUTION

- Before installing the Lower Shield Plate, attach the two gaskets to the plate. Make sure to align the gaskets' corners with the corners of the plate indicated by the red lines.

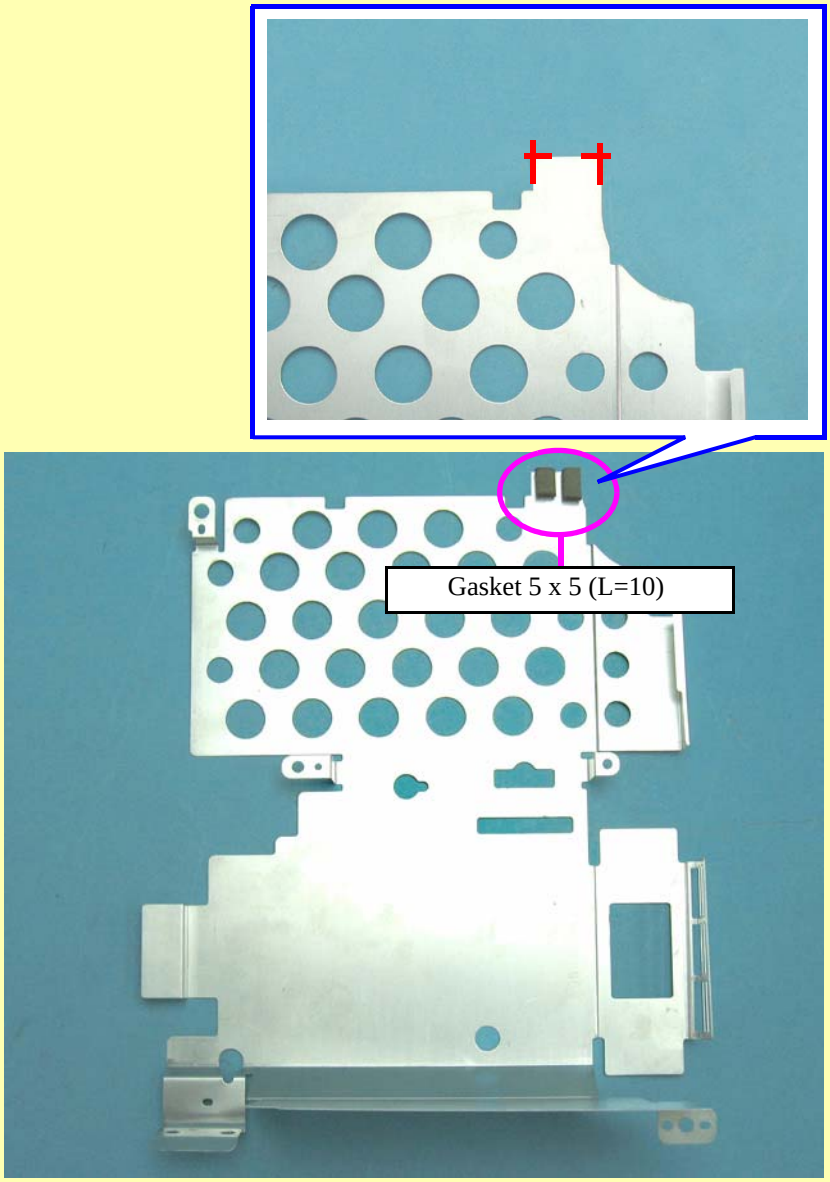


Figure 4-73.

CAUTION

■ Install the Lower Shield Plate to the Lower Case as shown below.

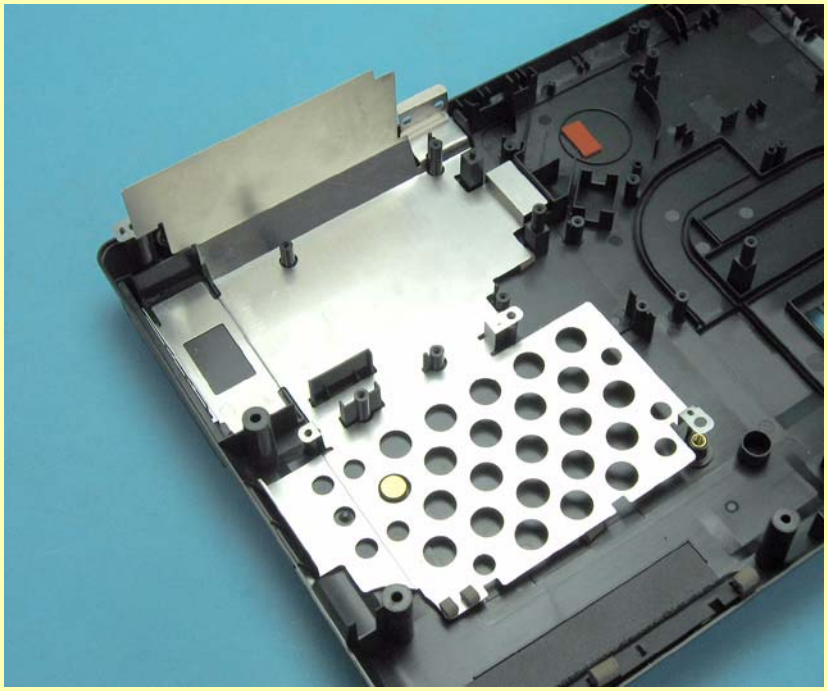


Figure 4-74.

Chapter 5　Adjustment

5.1 Overview

This chapter describes the adjustment procedures required after repairing or replacing certain parts.

5.1.1 Required Adjustment List

The adjustment required after repair work is listed below.

Table 5-1. Adjustment (Calibration)

Adjustment Item		
Adjustment name	**Purpose**	**Method**
G-Sensor's Zero Point Adjustment	To reset abnormal G-Sensor's Zero Point to adjust the Auto Keystone Correction function. • Judgment Process 1. Set the projector on an even workbench in the standard status, (refer to 5.2.1 "G-Sensor's Zero Point Adjustment" (p. 3)) and turn on the power. 2. Check the correction value in the	In the case that the correction value in the judgment is other than "0," execute the adjustment setting the projector on an even workbench. Start from the menu using the menu button on the control panel. (refer to 5.2.1 "G-Sensor's Zero Point Adjustment" (p. 3))
CMOS Image Sensor Calibration	To adjust the "Quick Setup" function, when replacing the IS Board Assy, or the Optical Engine and MAB set.	Execute the adjustment in a darkroom equipped with a screen setting the projector according to the specified standard.

5.1.2 Required Equipment/Tools

The adjustment procedures require the following equipment and tools.

Table 5-2. Required Equipment/Tools

Adjustment name	Required Equipment	Requirements
G-Sensor's Zero Point Adjustment	Workbench	• Having a flat even surface. • The inclination to the forward/backward/left/right is within 0.5°. (Measure the value using a level.)
CMOS Image Sensor Calibration	Darkroom	• The environment where no external light shines on the CMOS Image Sensor. • There are no strongly reflective things in front of the projector, such as a desk or a fixing metal or the like.
	Screen	• Must be more than 70 inch and over. • Must be a white matt coated screen. • No distortion or no dirt on the screen. • No foreign materials (tape or some reflective things) within the projected image (with Zoom Ring set to Wide) and in the outside of 40 cm left/right and 5cm above/below. (refer toFigure 5-1)
	Workbench	• There must be over 50 cm from the floor level to the setting position of the projector. (refer to Figure 5-2) • No inclination. (standard: allowed inclination within 2° to the forward/backward/Left/Right) • The projection distance must be within 100 cm ± 2 cm. (Projection distance: the distance between the projector and the screen.)

5.2 Adjustment (Calibration)

This section describes the procedures of the adjustment (Calibration).

5.2.1 G-Sensor's Zero Point Adjustment

The procedure of the G-Sensor's Zero Point Adjustment is explained below.

☐ Purpose

To reset abnormal G-Sensor's Zero Point to adjust the Auto Keystone Correction function, in the case that the G-Sensor's Zero Point has been set wrong for some reasons.

☐ Setting Environment

Set the projector on an even workbench.

- Adjust the workbench as even as possible; the allowed inclination to the forward/backward/left/right is within 0.5°. (Measure the value using a level.)

☐ Procedure

1. Check all the feet are set in the standard status. (Front Foot x 1 /Rear Foot x 2)
   - "Standard Status" means that all the feet are stowed fully to the end.
2. Keep pressing both the [Help] and [Source Search] buttons for five seconds.
   - The Zero Point Adjustment is executed.
   - When this adjustment has been successfully finished, a beep sounds once.

5.2.2 Inspection Procedure

After finishing the adjustment, check if the "Auto Keystone Correction" function works properly.

5.2.3 CMOS Image Sensor Calibration

The procedure of the CMOS Image Sensor Calibration is described below.

☐ Purpose

To adjust the "Quick Setup" function, when replacing the IS Board Assy, or the Optical Engine and MAB set.

☐ Setting Environment

- Use a darkroom with the environment where no external light shines on the CMOS Image Sensor.
- Use a white matt coated screen in the size of 70 inch and more.
- Use a screen without distortion or dirt.
- No foreign materials (tape or some reflective things) within the projected image (with Zoom Ring set to Wide most) and in the outside of 40 cm left/right and 5cm above/ below. (refer to Figure 5-1)

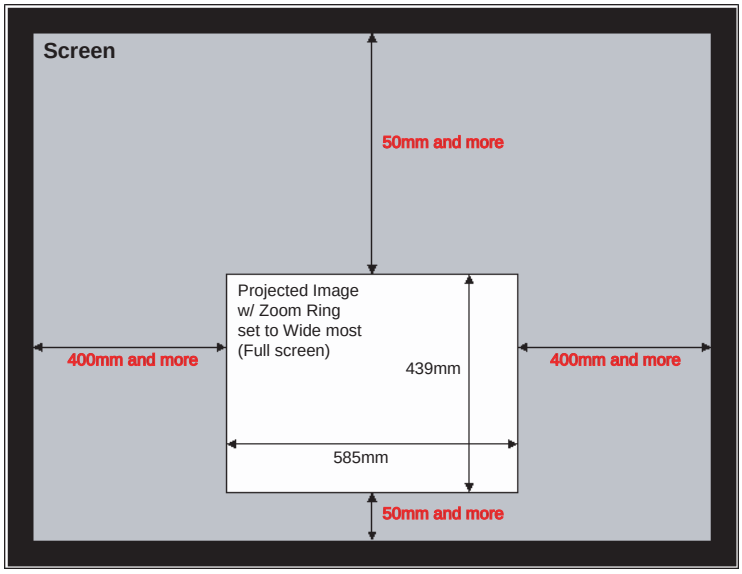


Figure 5-1.

- Do not input any visual signal. (Adjust the projector without any signals.)
- There must be no strongly reflective things in front of the projector, such as a desk or a fixing metal or the like. In the case that there are such things, be sure to cover them somehow such as covering them with a blackout curtain.
- Set the projector with all the feet fully stowed onto the even workbench with no inclination (standard: allowed inclination within 2° forward/backward/Left/Right)
- Set the projector straight to the screen. (set the axis of the projectinon lens perpendicular to the screen; allowed horizontal slant within 2°. To adjust the slant level with the projected image on the screen, adjust the difference of the length of the left side and the right side within 5mm.)

- There must be over 50 cm from the floor level to the setting position of the projector. (refer to Figure 5-2)
- The projection distance must be within 100 cm ± 2 cm. (Projection distance: the distance between the projector and the screen.)

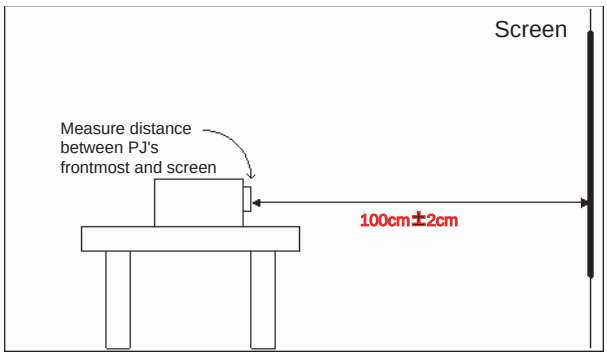


Figure 5-2.

☐ Procedure

1. Set the projector according to the requirement written above.
2. Turn on the power and wait 5minutes until the Lamp's illumination is stabilized.
3. Adjust the focus of the projected image with the Focus Ring.
4. On the Control Panel, press both the [Help] and [QuickSetup] buttons for 5 seconds.
   - A big "W (representing "Wide")" is displayed on the screen. [Pause Window 1]

Figure 5-3. Pause Window 1

5. Adjust the Zoom Ring manually to the Wide side to the end.
6. Adjust the focus of the projected image with the Focus Ring.

7. Press the [QuickSetup] button once.
   - The calibration at the Wide position starts.
   - When the calibration has been successfully finished, the image changes to a big "C (representing "Center") automatically. [Pause Window 2]

Figure 5-4. Pause Window 2

   - If the Zoom Ring is not set to the end of the Wide side, the image returns to the "W" (Pause Window 1) automatically.
   - If this calibration has been failed, the [Unsuccessful Termination] window is displayed. (refer to [Unsuccessful Termination] window (p. 7))
8. Adjust the Zoom Ring manually to the center position as shown in the figure below.

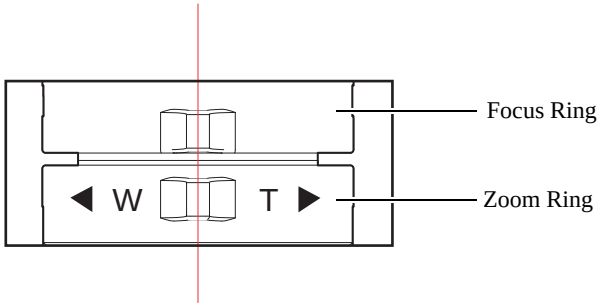


Figure 5-5. The Center position of the Zoom Ring

9. Adjust the focus of the projected image with the Focus Ring.

10.Press the [QuickSetup] button once.

- The calibration at the Center position starts.
- When the calibration has been successfully finished, the image changes to a big "T (representing "Tele") automatically. [Pause Window 3]

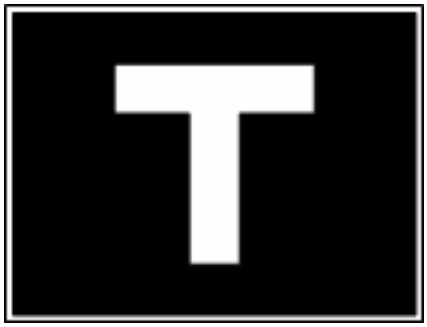


Figure 5-6. Pause Window 3

- If the Zoom Ring is not set to the Center position, the image returns to the "C" (Pause Window 2) automatically.
- If this calibration has been failed, the [Unsuccessful Termination] window is displayed. (refer to [Unsuccessful Termination] window (p. 7))

11.Adjust the Zoom Ring manually to the Tele side to the end.

12.Adjust the focus of the projected image with the Focus Ring.

13.Press the [QuickSetup] button once.

- The calibration at the Tele position starts.
- When the calibration has been successfully finished, the [Successful Finish] window is displayed.
- If the Zoom Ring is not set to the Tele position, the image returns to the "T" (Pause Window 3) automatically.
- If this calibration has been failed, the [Unsuccessful Termination] window is displayed.

■ [Successful Finish] window

A beep sounds and a blue image with "No siganal" message is displayed.

- Press any button to finish the calibration. (No change on the projected image.)

■ [Unsuccessful Termination] window

Three beeps sound and a red image with "No signal" message is displayed.

- Press any button to quit the calibration. ([Unsuccessful Termination] window is cleared.)

CAUTION

■ If the calibration fails, go back to the Step 3 and make adjustment once again. The case that the setting environment has a problem is also presumed, check the environment again, too.

■ In the case of [Unsuccessful Termination] or canceling, the successfully finished data before quitting are stored.

5.2.4 Inspection Procedure

After finishing the adjustment, check if the "QuickSetup" function works properly.

(For the details of the procedure of "QuickSetup" refer to the Users Manual of this product.)

Chapter 6　Appendix

CAUTION

The contents of this chapter are for use only by Epson Authorized Services, and are not to be disclosed to others without the express written consent of Epson.

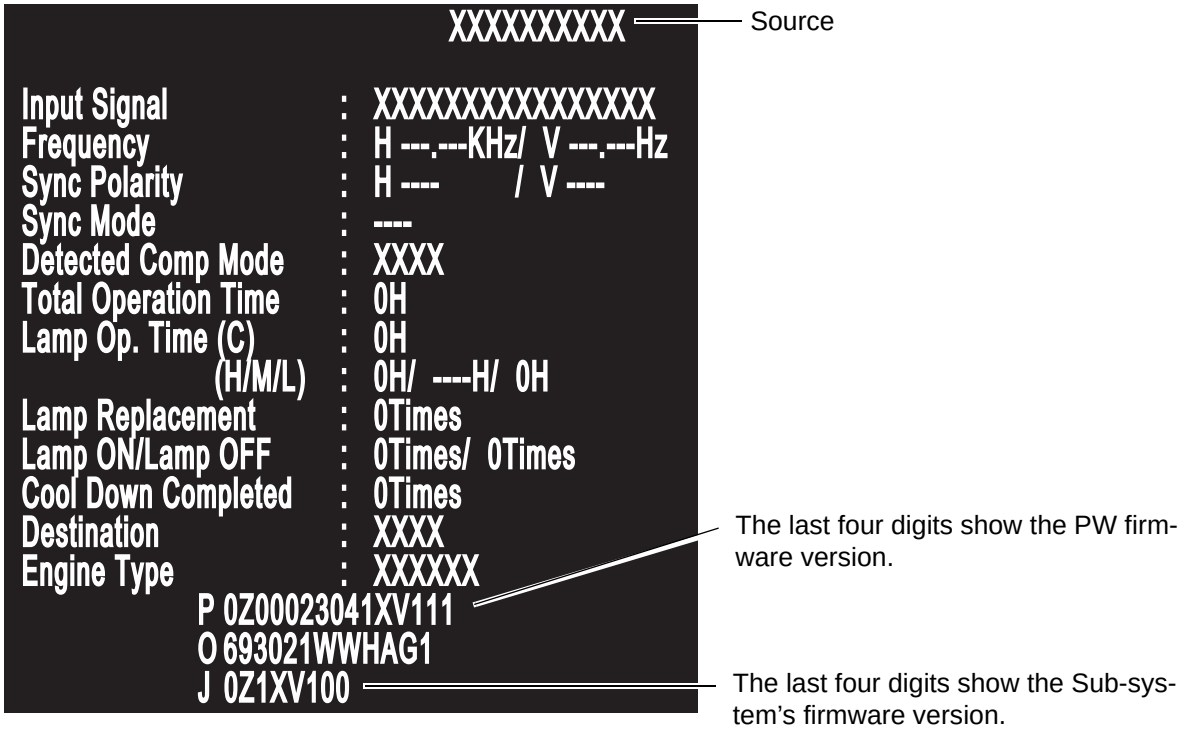
6.1 AS (After Service) Menu

This menu provides information and settings that are not displayed on the standard menu.

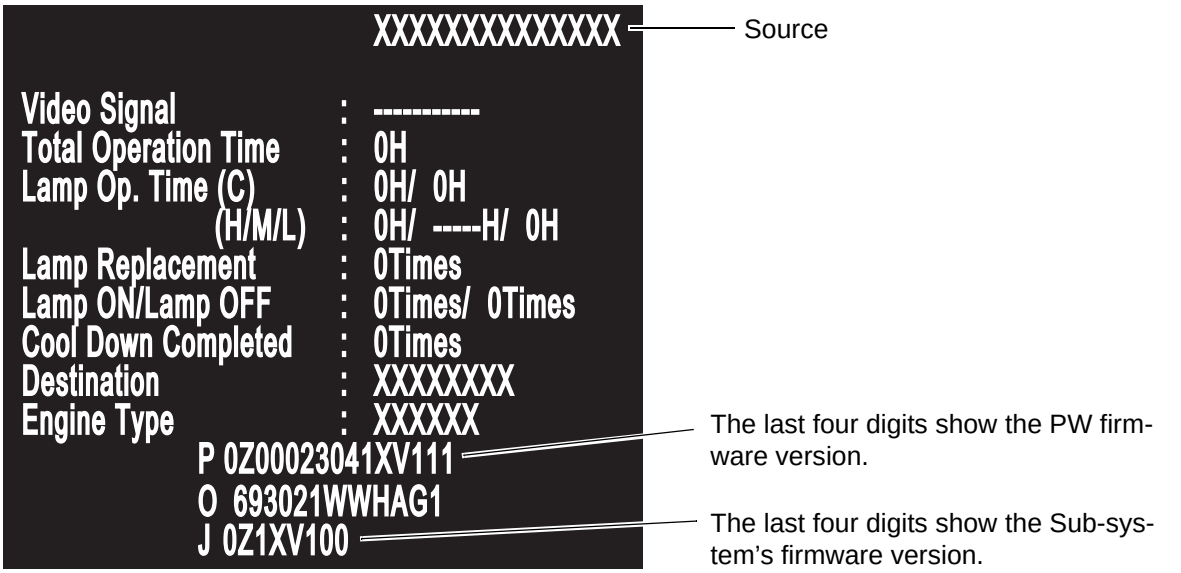
6.1.1 How To Display the AS (After Service) Menu

1. Press the **[Menu]** button either on the remote control or on the projector's control panel for at least 5 seconds.
2. Within 4 seconds after pressing the **[Menu]** button, hit these buttons in order shown below.
   [Esc] → **[Esc]** → **[Right]** → **[Left]**
   AS Menu is displayed. (The items vary according to the input source.)

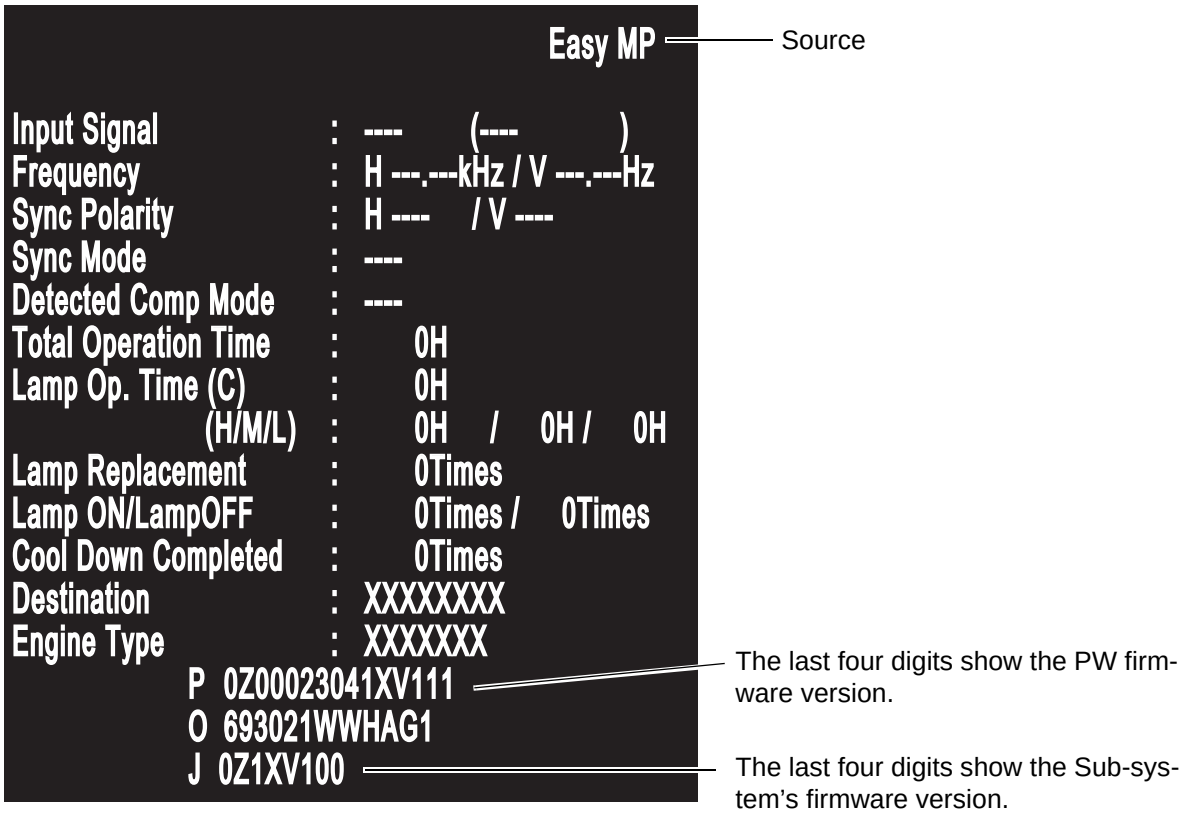
   ■ The video source's case. (Component, PC, HDMI, or D input (Page 1))


XXXXXXXXX
Source
Input Signal : XXXXXXXXXXXXXXX
Frequency : H ---.---KHz/ V ---.---Hz
Sync Polarity : H ---- / V ----
Sync Mode : ----
Detected Comp Mode : XXXX
Total Operation Time : 0H
Lamp Op. Time (C) : 0H
(H/M/L) : 0H/ ----H/ 0H
Lamp Replacement : 0Times
Lamp ON/Lamp OFF : 0Times/ 0Times
Cool Down Completed : 0Times
Destination : XXXX
Engine Type : XXXXXX
P 0Z00023041XV111
O 693021WWHAG1
J 0Z1XV100
The last four digits show the PW firmware version.
The last four digits show the Sub-system's firmware version.

■ S-Video/ Video's case. (Page 1)

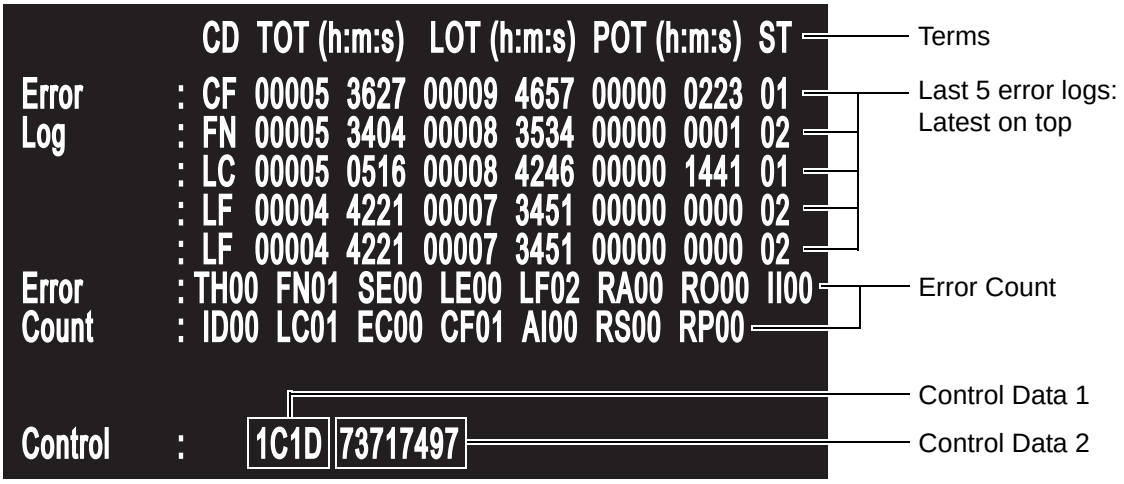

XXXXXXXXXXXXX
Source
Video Signal : ----------
Total Operation Time : 0H
Lamp Op. Time (C) : 0H/ 0H
(H/M/L) : 0H/ -----H/ 0H
Lamp Replacement : 0Times
Lamp ON/Lamp OFF : 0Times/ 0Times
Cool Down Completed : 0Times
Destination : XXXXXXXX
Engine Type : XXXXXX
P 0Z00023041XV111
O 693021WWHAG1
J 0Z1XV100
The last four digits show the PW firmware version.
The last four digits show the Sub-system's firmware version.

■ Easy MP's case. (Page 1)


Easy MP
Source
Input Signal : ---- (----)
Frequency : H ---.---kHz / V ---.---Hz
Sync Polarity : H ---- / V ----
Sync Mode : ----
Detected Comp Mode : ----
Total Operation Time : 0H
Lamp Op. Time (C) : 0H
(H/M/L) : 0H / 0H / 0H
Lamp Replacement : 0Times
Lamp ON/LampOFF : 0Times / 0Times
Cool Down Completed : 0Times
Destination : XXXXXXXX
Engine Type : XXXXXXX
P 0Z00023041XV111
O 693021WWHAG1
J 0Z1XV100
The last four digits show the PW firmware version.
The last four digits show the Sub-system's firmware version.

■ Error Log Window (Page 2)

While the AS menu is displayed, the Error Log Window can be displayed by pressing the **[Right]** button. To go back to the AS menu, press the **[Left]** button.



Item	Contents		Representation
Error Log	CD	Error Code	Two alphabets
	TOT	Total Operation Time	h: 5-digit number (00000-65535) Over 65535: “65535” (Not cleared to “0.”) m: 2-digit number (00-59) s: 2-digit number (00-59)
	LOT	Lamp Operation Time	
	POT	Time after Lamp is ON	
	ST	PJ (Projector)’s status	Acquired data of PWR? of the ESC/VP21 command

- The last 5 error logs are displayed (the latest on top). None is displayed if there’s no error.
- In the case of the above window, the latest error is “Cinema Filter Error” (TOT: 5 hours 36 minutes 27 seconds, LOT: 9 hours 46 minutes 57 seconds, POT: 0 hours 2 minutes 23 seconds, PJ’s status: Lamp ON).
- The 2nd latest error is “Fan Error” (TOT: 5 hours 34 minutes 4 seconds, LOT: 8 hours 35 seconds 34 minutes, POT: 0 hours 0 minutes 1 second, PJ’s status: Warming up).

Item	Contents		Representation
Error Count (times)	TH	Internal overheat	2-digit number (00-99) Over 99: “99” (Not cleared to “0.”)
	FN	Fan error	
	SE	Thermistor error	
	LE	Lamp burnt out	
	LF	Lighting failure	
	RA	Internal error (RAM)	
	RO	Internal error (ROM)	
	II	Internal error (I2S)	
	ID	Internal error (DR)	
	LC	Lamp cover open	
	EC	Connection failure to Electrical double layer capacitor	
	CF	Cinema Filter error	
	AI	Auto IRIS error	
	RS	Sub system ROM error	
	RP	Sub system error (PW error)	
Control	Control data 1	Thermal data of each thermistor	Acquired data of TEMP? of the ESC/VP21 command
	Control data 2	Voltage of each fan	Acquired data of TEMP? of the ESC/VP21 command

6.1.2 Initializing (Resetting) the AS Menu Values

The operational procedures and the values of initialization of the AS Menu are shown below.

Type	Clearing the Lamp Information	Clearing the AS Information	Clearing the Log Information
Operation / Item	Press **[Up]** and **[Source]** for 10 sec. during displaying Page 1/Page 2.	Press **[Down]** and **[Source]** for 10 sec. during displaying Page 1/ Page 2.	Press **[Right]** for more than 5 sec., then within 3 sec. press **[Select]** for 2 sec. during displaying Page 2.
Total Operation Time	No Change	Reset to 0H	No Change
Lamp Operation Time (C/H/M/L)	Reset to 0H	Reset to 0H	No Change
Lamp ON	Reset to 1	Reset to 1	No Change
Lamp OFF	Reset to 0	Reset to 0	No Change
Lamp Replacement	Add 1 to the current value	Reset to 0	No Change
Cool Down Complete	Reset to 0	Reset to 0	No Change
Error Log	No Change	No Change	Spacing (Status of acquiring none)
Error Count	No Change	No Change	Reset to 0
Control	No Change	No Change	No change